ORDER NO. TSD-8012-391

Service Manual

3 in 1 Stereo Music Centre

SG-165

FM/AM/FM STEREO WITH QUARTZ SYNTHESIZER, CASSETTE TAPE DECK AND RECORD PLAYER

DOLBY SYSTEM

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SG-165

Please use this manual together with the service manual for model No. SG-165(UK) order No. TSD-8012-390.

MODIFICATION

■ SPECIFICATIONS

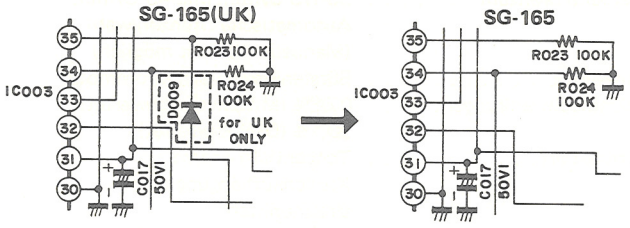
AM TUNER SECTION **SG-165(UK)** → **SG-165**

Intermediate Frequency(IF)....468 kHz → 450 kHz

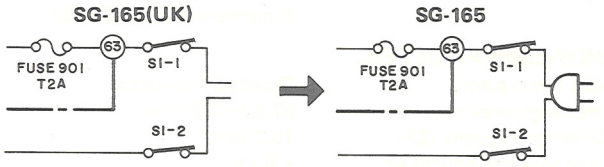
■ ALIGNMENT INSTRUCTIONS (Page 4)

STEP	SIGNAL GENERATOR OR SWEEP GENERATOR		SG-165(UK)	SG-165
	CONNECTION	FREQUENCY		
1			468 kHz 30% Mod. with 400 Hz	→ 450 kHz 30% Mod. with 400 Hz

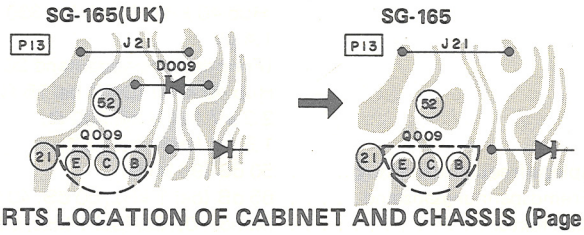
■ SCHEMATIC DIAGRAM (Page 13)



■ SCHEMATIC DIAGRAM (Page 13)



■ CIRCUIT BOARD AND WIRING CONNECTION (Page 14)



■ PARTS LOCATION OF CABINET AND CHASSIS (Page 25)

■ REPLACEMENT PARTS LIST (Page 16 ~ 24)

Ref. No.	Part No. SG-165(UK)	Part No. SG-165	Description	Per Set (Pcs)	Remarks
RECORD PLAYER (Page 12) for SEMKO, DEMKO, NEMKO & FINKO only					
14	SJY3028	→ SJY3028-1	Turntable	1	Changed
DIODES (Page 16)					
D009	MA162A	→ none	AM IF Offset	0	Deleted
COILS AND TRANSFORMERS (Page 17)					
T204	SLI7W106-M	→ SLI7W104-M	CFT, AM	1	Changed
OTHERS (Page 18)					
	SQX50320	→ SQX50316	Instruction Book	1	Changed
CABINET AND CHASSIS (Page 24)					
21	SMN1396	→ SMN1396-1	Panel, Rear	1	Changed
40	SJA136	→ SJA138	AC Cord	1	Changed

National Panasonic

Matsushita Electric Trading Co., Ltd.
P. O. Box 288, Central Osaka, Japan

DEUTSCH

TECHNISCHE DATEN

VERSTÄRKER

Ausgangsleistung:
- Musik . . . . . 2 x 60W an 4 Ω (1% Klirr)
- Sinus. . . . . 2 x 49W an 4 Ω (bei Aussteuerung einers Kanals, 1% Klirr)
  2 x 35W an 4 Ω (bei Aussteuerung beider Kanale, 0,08% Klirr)

Frequenzgang . . . . . 12 Hz bis 20 kHz, ±1,5 dB (DIN)
Leistungsbandbreite . . . . . 10 Hz bis 80 kHz, –3 dB (DIN) an 4 Ω (1% Klirr)
10 Hz bis 30 kHz, –3 dB (DIN) an 4 Ω (0,5% Klirr)
Eingangsempfindlichkeit und Impedanz:
- Mikrofon . . . . . 1 mV, 3 kΩ
- Aux . . . . . 150 mV, 47 kΩ
- Phono . . . . . 2,5 mV; 47 kΩ

Aufnahmeausgang und Impedanz . . . . . 150 mV, 2,2 kΩ
Klangregler:
- Bässe. . . . . ±12 dB bei 50 Hz
- Höhen . . . . . ±10 dB bei 15 kHz

Gehörrichtige Frequenzgang-korrektur . . . . . +10 dB bei 50 Hz (Lautstarkepegel –30 dB)

UKW-EMPFANGSTEIL

Abstimmsystem . . . . . Quartz-Synthesizer
Empfangsbereich . . . . . 87,5 ~ 108 MHz
Zwischenfrequenz (ZF) . . . . . 10,7 MHz
Eingangsempfindlichkeit . . . . . 1,9 µV (Fremdspannungsabstand 26 dB, Hub 40 kHz) (DIN) bei 300 Ω
1,4 µV (Fremdspannungsabstand 26 dB, Hub 40 kHz) (DIN) bei 75 Ω
2,3 µV (IHF) bei 300 Ω,
1,5 µV (IHF) bei 75 Ω
Spiegelfrequenzdämpfung:. . . . 50 dB (98 MHz)
Fremdspannungsabstand . . . . . 65 dB (bei 1 kHz, 60 dB, 40 kHz)
Klirrfaktor . . . . . Mono; 0,15% (bei 1 kHz, 60 dB, 40 kHz)
Stereo; 0,3% (bei 1 kHz, 60 dB, 40 kHz)
Übersprechdämpfung. . . . . 45 dB (bei 1 kHz, 60 dB, 40 kHz)
35 dB (250 Hz ~ 6,3 kHz, 60 dB, 40 kHz) (DIN)
30 dB (6,3 kHz ~ 10 kHz, 60 dB, 40 kHz) (DIN)
Trennschärfe. . . . . 70 dB (bei 1 kHz, 60 dB, 40 kHz)

AM-EMPFANGSTEIL

Empfangsbereiche. . . . . MW; 525 ~ 1605 kHz (571 ~ 187 m)
LW; 150 ~ 350 kHz (2.000 ~ 857 m)
Zwischenfrequenz (ZF) . . . . . 450 kHz
Empfindlichkeit. . . . . MW; 100 µV/m (1 MHz)
LW; 250 µV/m (240 kHz)
Spiegelfrequenzdämpfung . . . . MW; 50 dB (1 MHz)
LW; 38 dB (240 kHz)

Änderungen der technischen Daten und des Designs im Sinne ständiger Verbesserung vorbehalten.

CASSETTEN-TONBANDGERÄT

Prinzip:. . . . . Bandenden-Abschaltautomatik bei allen Bandlauffunktionen
Spursystem . . . . . Viertelspur, Stereo
Aufnahmesystem . . . . . HF-Vormagnetisierung (50 kHz) mit Dolby-Rauschunterdrückung
Löschsystem. . . . . HF-Löschung (50 kHz)
Bandgeschwindigkit. . . . . 4,75 cm/s
Frequenzgang . . . . . Normalband; 20 ~ 15.000 Hz
CrO_2-Band; 20 ~ 16.000 Hz
Metalband; 20 ~ 17.000 Hz
Fremdspannungsabstand . . . . Ohne Dolby;
53 dB (Normal) } (DIN)
55 dB (CrO_2) } (DIN)
57 dB (Metal) } (DIN)
Mit-Dolby; (über 5 kHz eine
61 dB (Normal) } Verbesserung
63 dB (CrO_2) } von mehr als
65 dB (Metal) } 10 dB) (DIN)
Löschdämpfung. . . . . 70 dB (DIN)
Übersprechdämpfung. . . . . 40 dB (DIN)
50 dB (bei 1 kHz)
Stereo-Kanaltrennung . . . . . 60 dB (DIN)
Gleichlaufschwankungen. . . . . 0,05% (Mittelwert, bewertet), ±0,15% (DIN-WTD)

PHONO

Plattenspielersystem . . . . . Direktantrieb, Automatischer Plattenspieler, Auto-Start/ Automatisches Einsetzen in die Einlaufrille, Auto-Stop, Spielwiederholungsfunktion, Automatische Drehzahlbestimmung, Automatische Plattengrößenbestimmung, Eimittlung des Vorhandenseins einer Schallplatte.
Plattenteller . . . . . Aluminium-Druckguß, Durchmesser 30 cm (12")
Plattentellerdrehzahl . . . . . 33-1/3 U/min, und 45 U/min. Automatische Drehzahlwahl (Manuelle Wahl ist möglich)
Phono-Motor . . . . . Bürstenloser Gleichstrommotor
Gleichlaufschwankungen. . . . . 0,08% (Mittelwert, bewertet), ±0,1% (DIN, bewertet)
Tonarmbauart . . . . . Tangential-Tonarm Kardanaufhängung mit 4 Drehpunkten
Tonarm-Antriebsmotor. . . . . Kernloser Gleichstrommotor
Tonabnehmer . . . . . Magnetodynamischer Stereo-Tonabnehmer (EPC-76SMAD)
Abtastdiamant. . . . . Blockdiamantspitze (EPS-76STSD)
Auflagekraftbereich des Abtastdiamanten. . . . . 1,5 ~ 2,5 g
Frequenzgang . . . . . 20 Hz bis 20 kHz
Kanaltrennung. . . . . 20 dB (DIN)
Fremdspannungsabstand . . . . . 65 dB (DIN-B)

LEISTUNGSAUFNAHME. . . 280 W

NETZSPANNUNG UND FREQUENZ . . . . . 110/120/220/240 V, 50/60 Hz

ABMESSUNGEN (B x H x T) . . 375 x 286 x 390 mm

GEWICHT . . . . . 14,2 kg

FRANÇAIS

CARACTERSTIQUES

SECTION AMPLIFICATEUR

Puissance de sortie	60 W x 2 (DHT 1%, 4 Ω) PSM 49 W x 2 (DHT 1%, 4 Ω) EFF. Un canal en fonction. 35 W X 2 (DHT 0,08%, 4 Ω) EFF. Deux canaux en fonction.
Réponse de fréquence	12 Hz ~ 20 kHz, ±1,5 dB (DIN)
Largeur de bande passente	10 Hz ~ 80 kHz, –3 dB (DIN) (DHT 1%, 4 Ω) 10 Hz ~ 30 kHz, –3 dB (DIN) (DHT 0,5%, 4 Ω)
Impédance et sensibilité d'entrée:	
Micro	1 mV, 3 kΩ
Aux	150 mV, 47 kΩ
Phono	2,5 mV, 47 kΩ
Impédance et sortie enr.	150 mV, 2,2 kΩ
Réglage de tonalité:	
Grave	±12 dB à 50 Hz
Aigu	±10 dB à 15 kHz
Réglage de contour sonore	+10 dB à 50 Hz (Volume à la position –30 dB)

SECTION TUNER FM

Système d'accord	Tuner synthétiseur à quartz
Echelle de fréquence	87,5 MHz ~ 108 MHz
Fréquence intermédiaire (FI)	10,7 MHz
Sensibilité	1,9 µV (S/B 26 dB mod. 40 kHz) (DIN) à 300 Ω 1,4 µV (S/B 26 dB mod. 40 kHz) (DIN) à 75 Ω 2,3 µV (IHF) à 300 Ω, 1,5 µV (IHF) à 75 Ω
Rapport d'impage	50 dB (98 MHz)
Rapport signal/bruit	65 dB (à 1 kHz, 60 dB, 40 kHz)
Distorsion	MONO; 0,15% (à 1 kHz, 60 dB, 40 kHz) STEREO; 0,3% (à 1 kHz, 60 dB, 40 kHz)
Séparation stéréo	45 dB (à 1 kHz, 60 dB, 40 kHz) 35 dB (à 250 Hz ~ 6,3 kHz, 60 dB, 40 kHz) DIN 30 dB (à 6,3 kHz ~ 10 kHz, 60dB, 40 kHz) DIN
Sélectivité	70 dB (à 1 kHz, 60 dB, 40 kHz)

SECTION TUNER AM

Echelle de fréquence	PO; 525 kHz ~ 1605 kHz (571 m ~ 187 m) GO; 150 kHz ~ 350 kHz (2000 m ~ 857 m)
Fréquence intermédiaire (FI)	450 kHz
Sensibilité	PO; 100 µV/m (1 MHz) GO; 250 µV/m (240 kHz)
Rapport image	PO; 50 dB (1 MHz) GO; 38 dB (240 kHz)

Les spécifications et la présentation sont susceptibles d'être modifiées sans préavis par suite d'amélioration éventuelle de nos appareils.

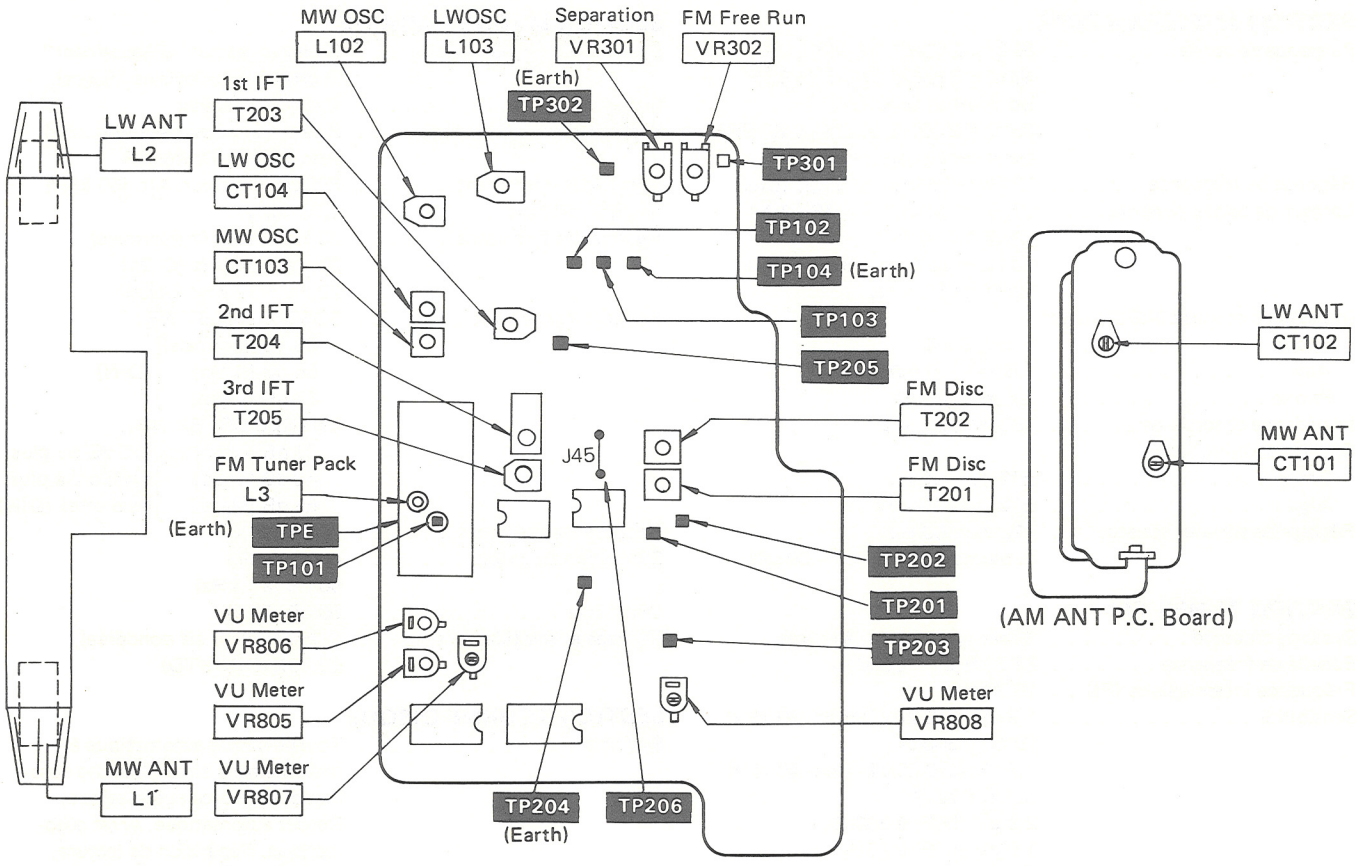
SECTION MAGNETOPHONE

Système de magnétophone	Commandes par "effleurement" et arrêt à automatisme intégral.
Système de piste	4 pistes, 2 canaux
Système d'enregistrement	Polarisation Cour. Alt. (50 kHz) avec système Dolby NR
Système d'effacement	Effacement Cour. Alt. (50 kHz)
Vitesse de bande	4,75 cm/s
Réponse de fréquence	20 Hz ~ 15 kHz (Normale) 20 Hz ~ 16 kHz (CrO_2) 20 Hz ~ 17 kHz (Métal)
Rapport signal/bruit	SORTIE DOLBY NR; 53 dB (Normale) 55 dB (CrO_2) (DIN) 57 dB (Métal) ENTREE DOLBY NR; 61 dB (Normale) 63 dB (CrO_2) (10 dB ou plus amélioré à plus de 5 kHz) (DIN) 65 dB (Métal)
Rapport d'effacement	70 dB (DIN)
Séparation de canal	40 dB (DIN) 50 dB (à 1 kHz)
Diaphonie	60 dB (DIN)
Pleurage et scintillement	0,05% (Valeur eff pondérée), ±0,15% (DIN-WTD)

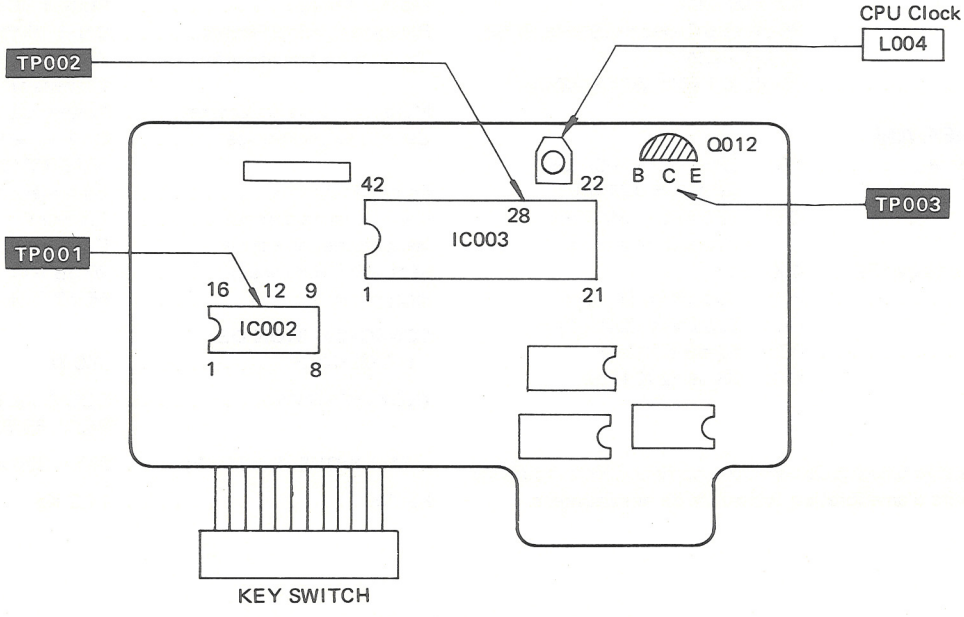
SECTION TOURNE-DISQUE

Système	Tourne-disque automatique à entraînement direct, Marche automatique/amorce automatique, Retour automatique, Arrêt automatique, Répétition de lecture, Sélection automatique de vitesse, Sélection automatique de diamètre, Détection de présence de disque
Plateau	Aluminium moulé, 30 cm (12") diamètre
Vitesse de rotation	33-1/3 et 45 t/mn. Sélection automatique de vitesse (Sélection manuelle possible)
Moteur phono	Moteur CC sans balai
Pleurage et scintillement	0,08% (WRMS), ±0,1% (DIN WTD)
Type de bras de lecture	A exploration linéaire Suspension à la cardan, 4 pivots
Moteur du bras de lecture	Moteur CC sans noyau
Cellulle phonolectrice	Cellule stéréo à aimant mobile (EPC-76SMAD)
Pointe de lecture	A diamant bloc (EPS-76STSD)
Plage de force d'appui	1,5 ~ 2,5 g
Réponse de fréquence	De 20 Hz à 20 kHz
Séparation des canaux	20 dB (DIN)
Rapport signal/bruit	65 dB (DIN-B)
CONSOMMATION DE PUISSANCE	280 W
ALIMENTATION	COUR. ALT. 110V, 120V, 220V, 240V, 50/60 Hz
DIMENSIONS (L x H x P)	375 x 286 x 390 mm
POIDS	14,2 Kg

ABGLEICHPUNKTE(RADIO)
POINTS D'ALIGNMENT(RADIO)



(RF P.C. Board)



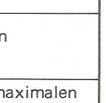
(Synthesizer P.C. Board)

ANWEISUNGEN ZUM ABGLEICH(RADIO)-1

■ AM-Ausrichtung

Steuerungsstellen:

1. Lautstärkensteuerung. . . . . Zentrum (AM-ZF und HF, UKW-HF), Minimum (UKW-ZF)
2. Bandwahl . . . . . LW, AM, UKW und Direkt
3. Radioschalter . . . . . An (ON)
4. Loudness. . . . . Aus (OFF)
5. UKW-Empfangsweiseschalter . . . . . UKW MONO und UKW AUTO
6. Latusprecherschalter . . . . . A
7. Der Ausgang des Signalgenerators sollte nicht höher sein als nötig ist, um eine Ausgangslesung zu erreichen.
8. Für die Ausrichtung muß das Lautsprechersystem mit dem Empfänger verbunden sein (oder es müssen 4 Ω Kunstalastwiderstände benutzt werden).

SCHRITT	SIGNALGENERATOR oder KIPPGENERATOR		ANZEIGE	ANZEIGER (VTVM oder SCOPE)	ABSTIMMEN	ANMERKUNGEN
	VERBINDUNG	FREQUENZ				
AM-ZF- und HF-Abstimmung						
1	Aus mehreren Drahtwindungen eine Schleife bilden und das Singal in die Schleife des Empfängers abstrahlen.	450 kHz 30% Mod. mit 400 Hz	Störungs-freier Punkt	Ausgangsmesser über Lautsprecherbuchse (L). (Imp. 4 Ω)	T203 (1. ZFT) T204 (2. ZFT) T205 (3. ZFT)	• Abstimmen für maximalen Ausgang.
2 (LW)		137 kHz 30% Mod. mit 400 Hz	137 kHz		L103 (LW-Oszillatorenspule)	• CT102 und CT104 auf Mittelstellung bringen. • Abstimmen für maximalen Ausgang.
3 (LW)		150 kHz 30% Mod. mit 400 Hz	150 kHz		L2 (LW-Antennenspule)	• L2 für maximalen Ausgang.
4 (LW)		350 kHz 30% Mod. mit 400 Hz	350 kHz		CT102 (LW-Antennentrimmer)	• Abstimmen für maximalen Ausgang. • Schritte (2) und (3) wiederholen.
5 (LW)		Kei Signal	137 kHz	Gleichstrom-VTVM zwischen TP103 und TP104 (Erde) verbinden.	L103 (LW-Oszillatorenspule)	• Nur wenn TP103 geringer als 1V ist (auf der VTVM-Anzeige), ist L103 auf 1V auf der VTVM-Anzeige abzustimmen. • Schritte (3) und (4) wiederholen.
		Kei Signal	350 kHz		CT104 (LW-Oszillatoren-trimmer)	• Nur wenn TP103 höher als 9V ist (auf der VTVM-Anzeige), ist CT104 auf 9V auf der VTVM-Anzeige abzustimmen. • Schritte (2), (3) und (4) wiederholen.
6 (MW)		520 kHz 30% Mod. mit 400 Hz	520 kHz	Ausgangsmesser über Lautsprecherbuchse (L). (Imp. 4 Ω)	L102 (MW-Oszillatorenspule)	• CT101 und CT103 sind auf Mittelstellung zu bringen. • Abstimmen für maximalen Ausgang.
7 (MW)		520 kHz 30% Mod. mit 400 Hz	550 kHz		L1 (MW-Antennenspule)	• L1 für maximalen Ausgang.
8 (MW)		1500 kHz 30% Mod. mit 400 Hz	1500 kHz		CT101 (MW-Antennentrimmer)	• Abstimmen für maximalen Ausgang. • Schritte (7) und (8) wiederholen.
9 (MW)		Kein Signal	520 kHz	Gleichstrom-VTVM zwischen TP103 und TP104 (Erde) verbinden.	L102 (MW-Oszillatorenspule)	• Nur wenn TP103 geringer als 1V ist (auf der VTVM-Anzeige), ist L102 auf 1V auf der VTVM-Anzeige abzustimmen. • Schritte (7) und (8) wiederholen.
		Kein Signal	1500 kHz		CT103 (MW-Oszillatoren-trimmer)	• Nur wenn TP103 höher als 9V ist (auf der VTVM-Anzeige), ist CT103 auf 9V auf der VTVM-Anzeige abzustimmen. • Schritte (6), (7) und (8) wiederholen.
UKW-ZF-Ausrichtung						
1	Hohe Seite zwischen Punkt TP101 und TPE (Erde) durch 1 pF	10.7 MHz (400 kHz SWP)	Störungs-freier Punkt	Vertikalen Verstärker-eingang des Oszillo-skops zwischen Punkt TP206 und TP204 (Erde) anschließen.	L3 (UKW-Tuner-Pack)	• L3 für maximale Amplitude und symmetrische Kurve einstellen. 
2	Kei Anschluß	Kein Signal	Frei	Gleichstrom-VTVM zwischen TP201 und TP202 anschließen.	T201 (UKW-Scheibe)	• T201 auf 0V auf der VTVM-Anzeige abstimmen.

HINWEIS: Da drei Ausgangsanzeigen vorliegen, müssen die Einstellungen bei Mittenfrequenz durchgeführt werden.

DEUTSCH

ANWEISUNGEN ZUM ABGLEICH(RADIO)-2

■ UKW-HF-Ausrichtung

SCHRITT	SIGNALGENERATOR		ANZEIGE	ANZEIGER (VTVM oder SCOPE)	UKW-EMPFANGS-WEISESCHALTER	ABSTIMMEN	ANMERKUNGEN
	VERBINDUNG	FREQUENZ					
UKW-MONO-Verzerrungsausrichtung							
1	Über Hilfsantenne mit EXT.-UKW-Antennenklemme verbinden.	98 MHz 100% Mod. mit 400 Hz	98 MHz	Verzerrungsmesser zur Lautsprecher-buchse (L). (Impe. 4 Ω)	MONO	T202 (UKW-Scheibe)	Auf minimum Anzeige des Ver-zerrungsmessers einstellen.

■ UKW-Stereo-Ausrichtung

Frei laufende Ausrichtung

EINRICHTUNGSVERBINDUNG	ABSTIMMEN	ANMERKUNGEN
Frequenzzähler mit TP301 und TP302 (Erde) verbinden und die Nichtmodulation mit dem 60 dB-Eingang.	VR302	VR302 auf 19 kHz ± 50 Hz an der Frequenzzähleran-zeige einstellen.

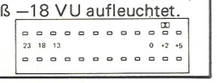
Trennungsausrichtung

HINWEISE:
1. Stereomodulator: Stereomodulator mit EXT.-Modulator des Signalgenerators verbinden.
2. Signalgenerator: Modulation des 19 kHz Pilotsignals. 9%
   Modulation des rechten und linken Signals . . . . . 30% (1 kHz)
   Ausgangspegel . . . . . 60 dB
3. Tuner (Balancesteuerung): Balancesteuerung so abstimmen, daß die Ausgangspegel beider Kanäle gleich werden.

EINRICHTUNGSVERBINDUNG			ABSTIMMEN	ANMERKUNGEN
SIGNALGENERATOR	VTVM	OSZILLOSKOP		
Über Hilfsantenne mit EXT.-UKW-Antennen-klemme verbinden.	Über Laut-sprecherbuchse verbinden (Imp. 4 Ω)	Vertikalen Verstärker-eingang des Oszilloskops mit Anschlußklemmen des VTVM berbinden.	VR301 (Trennungs-steuerung)	Während der Modulation der rechten Seite der Stereomodulation ist VR301 auf minimale Anzeige des VTVM abzustimmen. Während der Modulation der linken Seite der Stereomodulation ist VR301 ebenso für die rechte Seite einzustellen. Auf die beste Balance zwischen "L and R" und "R nach L"-Trennung einstellen.

HINWEIS: Währen der Trennungsausrichtung ist die Frequenzzählerverbindung zu unterbrechen.

■ VU-Meter-Ausrichtung

SCHRITT	VTVM-VERBINDUNG		ARBEITSWEISE DES TONBAND-DECKS	DOLBY NR-SCHALTER	ABSTIMMEN	ANMERKUNGEN
	POSITIV	NEGATIV				
1	TP803 TP804	TP805	Aufnahme	Ein	Aufnahme-lautstärke	• 150 mV, 1 kHz AUX zuführen. • Aufnahmelautstärke so abstimmen, daß eine Anzeige von 580 mV am VTVM erreicht wird.
2	Keine Verbindung			Ein	VR807 VR808	• VR807 und VR803 so abstimen, daß das Licht bei der 2 dB (▯▯ Markierung) aufleuchtet.
3	Keine Verbindung			Ein	VR805 VR806	• Das eingeführte Signal um −20 dB abdämpfen, VR805 und VR806 so abstimmen, daß −18 VU aufleuchtet. • Schritte (2) und (3) wie-derholen. 

■ Syntheziserausrichtung

Syntheziserausrichtung

SCHRITT	AUSRICHTUNGS-OBJEKT	ZÄHLERVERBINDUNG		ABSTIMMEN	ANMERKUNGEN
		POSITIV	NEGATIV		
1	PLL Normaler Oszillator	TP001 (Nadel 12 von IC002)	Abschirmge-häuse	—	• Frequenzzähler zwischen TP001 und Abschirmgehäuse anschließen. • Die Frequenz muß 100 kHz ±0.9 Hz betragen.
2	CPU-Uhrenfrequenz	TP002 (Nadel 28 des IC003)	,,	L004	• Frequenzzähler zwischen TP002 und Abschirmgehäuse anschließen. • Die Frequenz muß 150 kHz ∼ 200 kHz betragen. L004 so abstimmen, daß 200 kHz gezählt werden, wenn die Frequenz über 200 kHz liegt.
		TP003 (Q012 Sammler)	,,	—	• Frequenzzähler zwischen TP003 und Abschirmkasten anschließen. • Die Frequenz muß 250 Hz ∼ 300 Hz betragen.
3	UKW-Frequenz-Bandbreite	.....	.....	.....	• Die Frequenzanzeige muß "108,00" MHz werden. Dazu ist "87,5" MHz abzurufen und die "DOWN"-Taste SW einmal zu drücken. • Die Frequenzanzeige muß "87.5" MHz werden. Dazu wird "108.000" MHz abberufen und die "UP"-Taste SW einmal gedrückt. • Die Frequenzanzeige muß "000,000 — an- und abschalten — Fehleranzeige" werden. Dazu werden die anderen Frequenzen, außer "87.5" MHz ∼ "108,00" MHz, abberufen.

DEUTSCH

ANWEISUNGEN ZUM ABGLEICH(KASSETTEN-TONBAND)

■ **Ausrichtung des Cassettenband-Decks**

Vorspannungsausrichtung

Steuerungsstellen:
1. Funktion . . . . . Band
2. Arbeitsweise des Band-Decks . . . . Aufnahme
3. DOLBY-Schalter . . . . . Aus

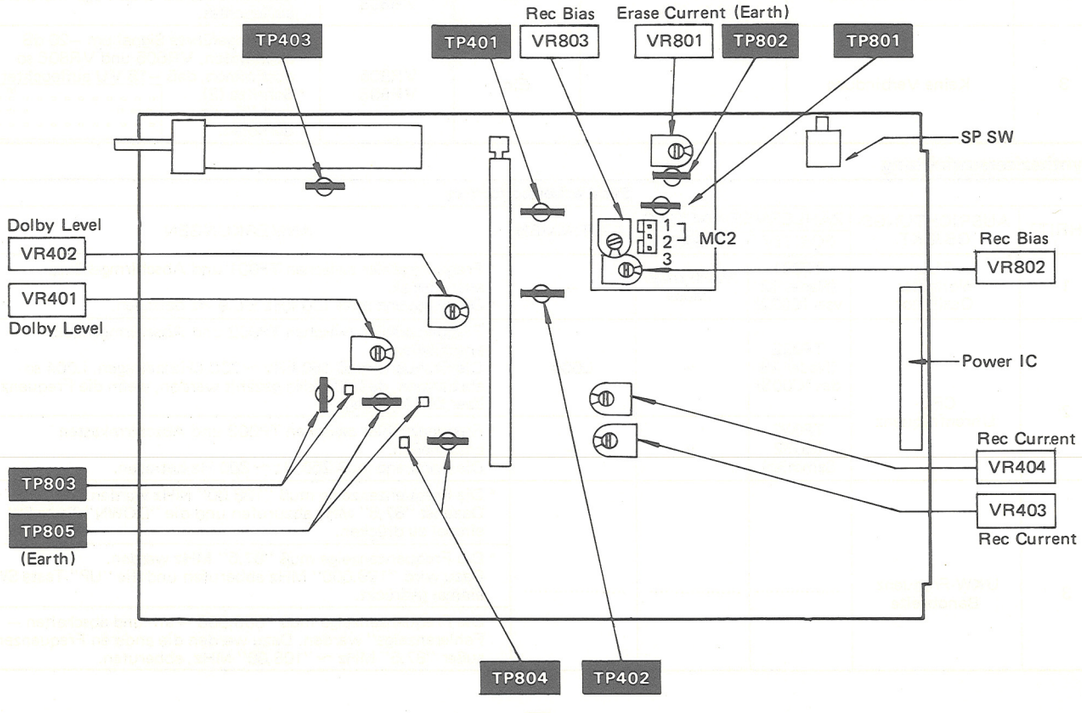
SCHRITT	AUSRICHTUNGS-OBJEKT	VTVM-VERBINDUNG		BANDWAHL	ABSTIMMEN	ANMERKUNGEN
		POSITIV	NEGATIV			
1	Löschvorspannung	TP801	TP802	METAL	VR801	• VR802 und VR803 Mitte abstimmen. • VR801 so abstimmen, daß die VTVM-Anzeige 150 mV beträgt.
2	Aufnahme-vorspannung	TP401 (L Kanel) TP402 (R Kanel)	TP403	NORMAL	VR803	• VR803 so abstimmen, daß der Unterschied der Anzeigen der beiden VTVM 0,3 mV nicht übersteigt.
3	Aufnahme-vorspannung	TP401 (L Kanel) TP402 (R Kanel)	TP403	NORMAL	VR802	• VR802 so abstimmen, daß die Anzeige des VTVM 3,8 mV beträgt. (METAL: 9,4 ±0.4 mV) • Schritte (1) und (2) wiederholen.

Ausrichtung für Azimuth, DOLBY und Aufnahmestrom

Steuerungsstellen:
1. Funktion . . . . . Band
2. Arbeitsweise des Band-Decks . . . . Wiedergabe
3. Bandwahl . . . . . Normal

SCHRITT	AUSRICHTUNGS-OBJEKT	VTVM-VERBINDUNG		PROBE-BAND	DOLBY-SCHALTER	ABSTIMMEN	ANMERKUNGEN
		POSITIV	NEGATIV				
1	R/P-Kopf Azimuth	Latusprecher-anschluß	Lausprecher-anschluß	VTT653 (10 kHz)	Aus	Kopfknopf	• Knopf auf maximale Anzeige am VTVM abstimmen.
2	DOLBY-Pegel	TP803 TP804	TP805	VTT6130	Ein	VR401 VR402	• VR401 und VR402 auf 580 ±20 mV Anzeige am VTVM abstimmen.
3	Aufnahmestrom	TP401 (L Kanel) TP402 (R Kanel)	TP403	.....	Ein	VR403 VR404	• Kurzschlußbügel zwischen Anschlußklemme 1 und 2 des MC2 anschließen. • 1 kHz, 150 mV bei AUX IN eingeben and den Lautstärken-pegel der Aufnahme am DOLBY-Pegel abstimmen. • VR403 und VR404 auf 0,58 ±0,02 mV Anzeige am VTVM abstimmen.

ABGLEICHPUNKTE(CASSETTEN-TONBAND)



FRANÇAIS

INSTRUCTIONS D'ALIGNMENT-1

■ **Alignement de AM**

Positions des commandes
1. Commande de volume . . . . . Centre (AM-IF et RF, FM-RF), Minimum (FM-IF)
2. Sélecteur de bande . . . . . LW, MW, FM et Direct
3. Commutateur radio . . . . . ON
4. Correction physiologique . . . . . OFF
5. Contacteur de mode FM . . . . . FM MONO et FM AUTO
6. Sélecteur d'enceintes . . . . . A
7. La sortie du générateur de signaux ne doit pas être supérieure à la valeur nécessaire à l'obtention d'une indication de sortie.
8. Lors de l'alignement, veiller à ce que les enceintes soient bien raccordées au récepteur.

PALIER	GENERATEUR DE SIGNAUX OU GENERATEUR DE BALAYAGE		AFFICHAGE	INDICATEUR (VOLTMETRE ELECTRONIQUE OU ECRAN)	REGLAGE	REMARQUES
	CONNEXION	FREQUENCE				
Alignement de AM-FI et FR						
1	Former une bouche de plusieurs tours de cordon et faire rayonner le signal dans la boucle du récepteur	450 kHz 30% de mod. pour 400 Hz	Point de non-inter-férence	Appareil de mesure de sortie raccordé à la prise d'enceinte (Gche) (Imp: 4 Ω)	T203 (1ère IFT) T204 (2ème IFT) T205 (3ème IFT)	• Régler pour une sortie maximale.
2 (GO)		137 kHz 30% de mod. pour 400 Hz	137 kHz		L103 (Bobine LW OSC)	• Amener CT102 et CT104 en position médiane. • Régler pour une sortie maximale.
3 (GO)		150 kHz 30% de mod. pour 400 Hz	150 kHz		L2 (Bobine LW ANT)	• Régler L2 pour une sortie maximale.
4 (GO)		350 kHz 30% de mod. pour 400 Hz	350 kHz		CT102 (Trimmer LW ANT)	• Régler pour une sortie maximale. • Recommencer les paliers (2) et (3).
5 (GO)		Absence de signal	137 kHz	Brancher un voltmetre électronique à CC entre TP103 et TP104 (masse)	L103 (Bobine LW OSC)	• Si l'indication du voltmètre électronique est inférieure à 1V pour TP103, amener à cette valeur en agissant sur L103. • Recommencer les paliers (3) et (4).
		Absence de signal	350 kHz		CT104 (Trimmer LW OSC)	• Si l'indication du voltmètre électronique est supérieure à 9V pour TP103, amener CT104 à cette valeur (sur le voltmètre). • Recommencer les paliers (2), (3) et (4).
6 (PO)		520 kHz 30% de mod. pour 400 Hz	520 kHz	Appareil de mesure de sortie raccordé à la prise d'enceinte (Gche) (Imp: 4 Ω)	L102 (Bibine MW OSC)	• Amener CT101 et CT103 en position médiane. • Régler pour une sortie maximale.
7 (PO)		550 kHz 30% de mod. pour 400 Hz	550 kHz		L1 (Bobine MW ANT)	◦ Régler L1 pour une sortie maximale.
8 (PO)		1500 kHz 30% de mod. pour 400 Hz	1500 kHz		CT101 (Trimmer MW ANT)	◦ Régler pour une sortie maximale. ◦ Recommencer les paliers (7) et (8).
9 (PO)		Absence de signal	520 kHz	Brancher un voltmètre électronique à CC entre TP103 et TP104 (masse)	L102 (Bobine MW OSC)	• Si l'indication du voltmètre électronique est inférieure à 1V pour TP103, amener à cette valeur en agissant sur L102. • Recommencer les paliers (7) et (8).
		Absence de signal	1500 kHz		CT103 (Trimmer MW OSC)	• Si l'indication du voltmètre électronique est supérieure à 9V pour TP103, amener CT103 à cette valeur (sur le voltmètre). • Recommencer les paliers (6), (7) et (8).
Alignement de FM-FI						
1	Côté élevé par 1 pF entre TP101 et TPE (masse).	10.7 MHz (balayage de 400 Hz)	Point de non-inter-férence	Raccorder l'entrée de l'ampli vertical de l'écran entre TP206 et TP204 (masse)	L3 (blockd'accord FM)	• Régler L3 pour une courbe d'amplitude et de symétrise maximales.
2	Aucune connexion	Absence de signal	Libre	Raccorder le voltmètre électronique à CC entre TP201 et TP202.	T201 (disque FM)	• Régler T201 pour une indication de 0 mV sur le voltmètre électronique.

NOTE: Etant donné que trois indications de sortie sont visualisées, les réglages doivent être faits à la fréquence centrale.

INSTRUCTIONS D'ALIGNMENT-2

■ Alignement de FM-FR

PALIER	GENERATEUR DE SIGNAUX		AFFICHAGE	INDICATEUR (VOTMETRE ELECTRONIQUE OU ECRAN)	CONTACTEUR DE MODE FM	REGLAGE	REMARQUES
	CONNEXION	FREQUENCE					
DISTORTION ALIGNEMENT DE FM-MONO							
1	Raccorder à la borne EXT. FM au moyen d'une antenne fictive.	98 MHz 100% de mod. pour 400 Hz	98 MHz	Distortiomètre branché sur la prise d'enceinte (Gche) (Imp: 4 Ω)	MONO	T202 (disque FM)	Régler pour une indication minimale du distortiomètre.

■ Alignement de FM stéréo

ALIGNEMENT DE MARCHE LIBRE

CONNEXION D'EQUIPEMENT	REGLAGE	REMARQUES
Connecter le compteur de fréquence avec TP301 et TP302 (masse) à 98 MHz, non modulation pour entrée de 60 dB.	VR302	Régler VR302 pour une indication de 19 kHz ± 50 Hz sur le compteur de fréquence.

ALIGNEMENT DE SEPARATION

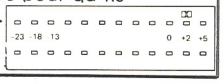
Notes:
1. Modulateur stéréo: Connecter le modulateur stéréo avec la borne EXT, Mod du générateur de signaux.
2. Générateur de signaux: Taux de modulation du signal pilote de 18 kHz. . . . 9%
   Taux de modulation des signaux droit et gauche . . . 30% (1 kHz)
   Niveau de sortie. . . . . 60 dB
3. Tuner (commande de balance): Agir sur la commande de balance manière à ce que le niveau de sortie soit équivalent pour chaque canal.

CONNEXION D'EQUIPEMENT			REGLAGE	REMARQUES
GENERATEUR DE SIGNAUX	VOLTMETRE ELECTRONIQUE	OSCILLOSCOPE		
Connecter à la borne d'antenne EXT FM au moyen d'une antenne fictive.	Connecter avec la prise d'enceinte (Imp: 4 Ω)	Connecter l'entrée de l'ampli vertical aux bornes du voltmètre électronique.	VR301 (commande de séparation)	Régler VR301 pour une indication minimale du voltmètre électronique à partir de la sortie du canal gauche au moment ou le canal droit de la modulation stéréo est modulé. Agir sur VR301 de la même manière pour le canal droit. Régler pour un équilibre optimal entre la séparation "Gche-Drte" et "Drte-Gche".

Note: Lors de l'alignement de séparation, il convient de débrancher le compteur de fréquence.

■ Alignement de VU-Mètre

PALIER	CONNEXION DU VOLTMETRE ELECTRONIQUE		MODE DE LA PLATINE MAGNETOPHONE	COMMUTATEUR DOLBY NR	REGLAGE	REMARQUES
	Positif	Négatif				
1	TP803 TP804	TP805	Enregistrement	IN	Volume REC	• Soumettre AUX à 150 mV, 1 kHz. • Régler le volume d'enregistrement pour une indication de 580 mV sur le voltmètre électronique.
2	Pas de connexion			IN	VR807 VR808	• Régler VR807 et VR808 pour qu'ils s'allument à +2 dB (symbole ▯▯).
3	Pas de connexion			IN	VR805 VR806	• Atténuer le signal envoyé de −20 dB puis régler VR805 et VR806 pour qu'ils s'allumente à −18 VU. • Recommencer les paliers 2 et 3.



■ Alignement du Synthetiseur

ALIGNEMENT DU SYNTHETISEUR

PALIER	POINT D'ALIGNEMENT	CONNEXION DU COMPTEUR		REGLAGE	REMARQUES
		Positif	Négatif		
1	OSC standard PLL	TP001 (broche 12 de IC002)	Coffrage protecteur	—	• Connecter le compteur de fréquence entre TP001 et le coffrage protecteur. • Vérifier si la fréquence est bien de 100 kHz ± 0,9 Hz.
2	Fréquence horloge CPU	TP002 (broche 28 de IC003)	"	L004	• Connecter le compteur de fréquence entre TP002 et le coffrage protecteur. • Vérifier si la fréquence est bien de 150 ~ 200 Hz et régler L004 pour arriver à 200 kHz lorsque la fréquence dépasse cette valeur.
		TP003 (collecteur Q012)	"	—	• Connecter le compteur de fréquence entre TP003 et le coffrage protecteur. • Vérifier si la fréquence est bien de 250 ~300 Hz.
3	Largeur de bande de fréquence FM	.....	.....	.....	• Vérifier si l'affichage de fréquence visualise bien "108,00 MHz" en rappelant "87,5 MHz" et en appuyant une fois sur la touche "DOWN". • Vérifier si l'affichage de fréquence visualise bien "87,5 MHz" en rappelant "108,00 MHz" et en appuyant une fois sur la touche "UP". • Vérifier si l'affichage de fréquence visualise bien "000,00 — mis sous et hors tension — affichage d'erreur" en rappelant l'autre fréquence parallèlement à "87,5 MHz" ~ "108,00 MHz".

FRANÇAIS

INSTRUCTIONS D'ALIGNMENT(MAGNETOPHONE)

■ **Alignement de Platine Magnetocassette**

ALIGNEMENT DE BIAIS

Position des commandes:
1. Function . . . . . Tape
2. Mode . . . . . Enregistrement
3. Commutateur de Dolby . . . . . OUT

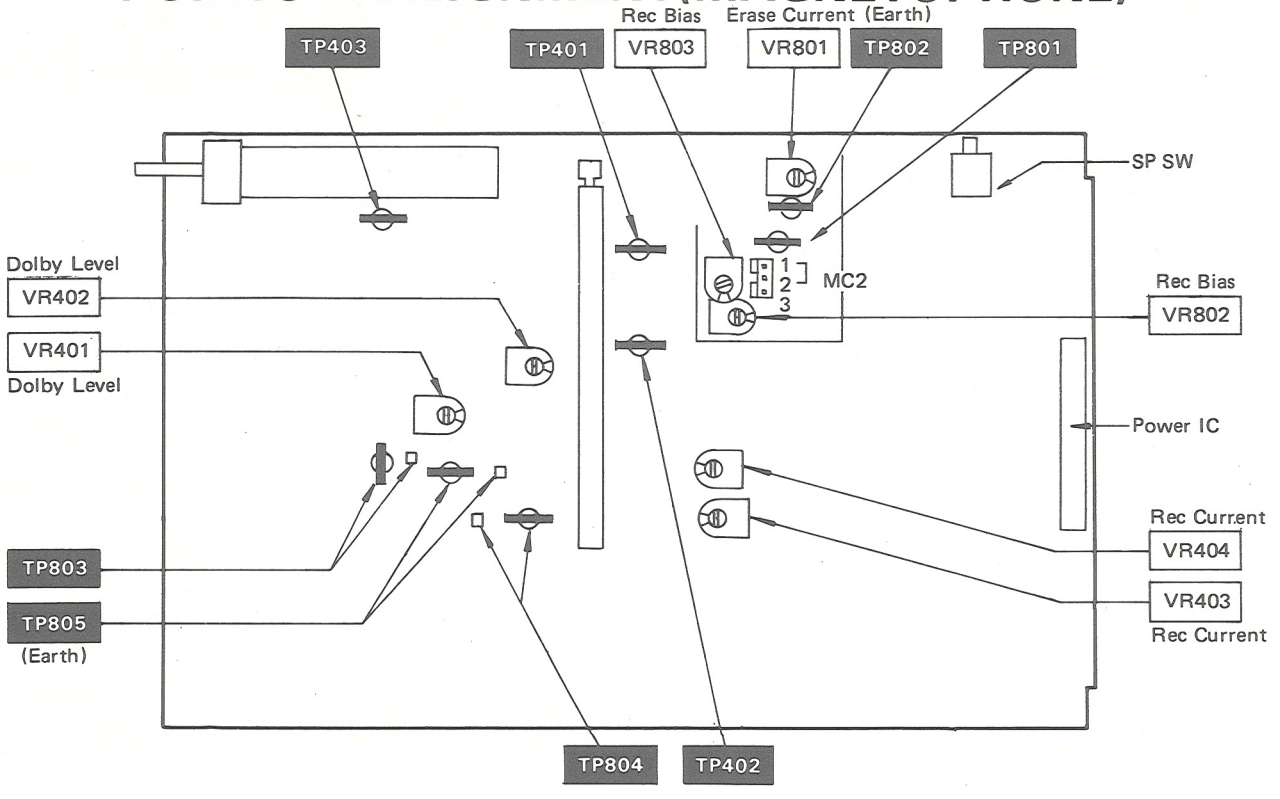
PALIER	POINT A ALIGNER	CONNEXION DU VOLTMETRE ELECTRONIQUE		SELECTEUR DE BANDE	REGLAGE	REMARQUES
		Positif	Négatif			
1	Polarisation d'effacement	TP801	TP802	METAL	VR801	• Régler le centre de VR802 et VR803. • Régler VR801 pour obtenir 150 mV sur le voltmètre électronique.
2	Prémagnétisation	TP401 (can. Gche) TP402 (can. Drt)	TP403	NORMAL	VR803	• Régler VR803 pour une différence d'indication de 0,3 mV sur le voltmètre électronique.
3	Prémagnétisation	TP401 (can Gche) TP402 (can Drt)	TP403	NORMAL	VR802	• Régler VR802 pour obtenir 3,8 mV sur le voltmètre électronique. (METAL: 9,4 ± 0,4 mV) • Recommencer les paliers 1 et 2.

ALIGNEMENT D'AZIMUT, DE DOLBY ET DE COURANT D'ENREGISTREMENT

Position des commandes:
1. Function . . . . . Tape
2. Mode . . . . . PLAY
3. Sélecteur de bande . . . . . NORMAL

PALIER	POINT A ALIGNER	CONNEXION DU VOLTMETRE ELECTRONIQUE		BANDE D'ESSAI	COMMUTATEUR DOLBY	REGLAGE	REMARQUES
		Positif	Négatif				
1	Azimut de tête d'enr/lec.	Borne d'enceinte	Borne d'enceinte	VTT653 (10 kHz)	OUT	Vis de tête	• Agir sur la vis pour que l'indication du voltmètre électronique soit maximale.
2	Niveau de Dolby	TP803 TP804	TP805	VTT6130	IN	VR401 VR402	• Régler VR401 et VR402 pour que l'indication du voltmètre électronique soit de 580 ± 20 mV.
3	Courant d'enregistrement	TP401 (can. Gche) TP402 (can. Drt)	TP403	.....	IN	VR403 VR404	• Connecter un cavalier entre les bornes 1 et 2 de MC2. • Soumettre AUX IN à 1 kHz, 150 mV et régler le niveau d'enregistrement au niveau Dolby. • Régler VR403 et VR404 pour que l'indication du voltmètre électronique soit de 0,58 ± 0,02 mV.

POINTS D'ALIGNMENT(MAGNETOPHONE)



ORDER NO. TSD-8012-390

Service Manual

FM/AM/FM STEREO WITH QUARTZ SYNTESIZER, CASSETTE TAPE DECK AND RECORD PLAYER

3 in 1 Stereo Music Centre

SG-165

for United Kingdom

SG-165 (UK)

DOLBY SYSTEM

*"Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
*Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

Specifications

AMPLIFIER SECTION

Power Output	MPO 60 W x 2 (THD 1%, 4 Ω) RMS 49 W x 2 (THD 1%, 4 Ω) One channel driven RMS 35 W x 2 (THD 0.08%, 4 Ω) Both channels driven
Frequency Response	12 Hz ~ 20 kHz, ± 1.5 dB (DIN)
Power Band Width	10 Hz ~ 80 kHz, −3 dB (DIN) (THD 1%, 4 Ω) 10 Hz ~ 30 kHz, −3 dB (DIN) (THD 0.5%, 4 Ω)
Input Sensitivity & Impedance:	
Mic	1 mV, 3 kΩ
Aux	150 mV, 47 kΩ
Phono	2.5 mV, 47 kΩ
Rec Out & Impedance	150 mV, 2.2 kΩ
Tone Controls:	
Bass	±12 dB at 50 Hz
Treble	±10 dB at 15 kHz
Loudness Control	+10 dB at 50 Hz (Volume at −30 dB position)

FM TUNER SECTION

Tuning System	Quartz Synthesizer
Frequency Range	87.5 MHz ~ 108 MHz
Intermediate Frequency (IF)	10.7 MHz
Sensitivity	1.9 μV (S/N 26 dB mod. 40 kHz) (DIN) at 300 Ω 1.4 μV (S/N 26 dB mod. 40 kHz) (DIN) at 75 Ω 2.3 μV (IHF) at 300 Ω 1.5 μV (IHF) at 75 Ω
Image Ratio	50 dB (98 MHz)
Signal/Noise Ratio	65 dB (at 1 kHz, 60 dB, 40 kHz)
Distortion	MONO: 0.15% (at 1 kHz, 60 dB, 40 kHz) STEREO: 0.3% (at 1 kHz, 60 dB, 40 kHz)
Stereo Separation	45 dB (at 1 kHz, 60 dB, 40 kHz) 35 dB (at 250 Hz ~ 6.3 kHz, 60 dB, 40 kHz) (DIN) 30 dB (at 6.3 kHz ~ 10 kHz, 60 dB, 40 kHz) (DIN)
Selectivity	70 dB (at 1 kHz, 60 dB, 40 kHz)

AM TUNER SECTION

Frequency Range	MW:	525 kHz ~ 1605 kHz (571 m ~ 187 m)
	LW:	150 kHz ~ 350 kHz (2000 m ~ 857 m)
Intermediate Frequency (IF)	468 kHz	
Sensitivity	MW:	100 μV/m (1 MHz)
	LW:	250 μV/m (240 kHz)
Image Ratio	MW:	50 dB (1 MHz)
	LW:	38 dB (240 kHz)

TAPE DECK SECTION

Deck System	Full Auto Shut Off Cassette System
Track System	4-Track, 2-Channel
Recording System	AC Bias (50 kHz) with Dolby NR System
Erasing System	AC Erase (50 kHz)
Tape Speed	4.75 cm/sec. (1-7/8 i.p.s.)
Frequency Response	20 Hz ~ 15 kHz (normal) 20 Hz ~ 16 kHz (CrO_2) 20 Hz ~ 17 kHz (Metal)
Signal/Noise Ratio	DOLBY NR-OUT: 53 dB (Normal) 55 dB (CrO_2) 57 dB (Metal) (DIN) DOLBY NR-IN: 61 dB (Normal) 63 dB (CrO_2) 65 dB (Metal) (10 dB or more improved at more than 5 kHz) (DIN)
Erase Ratio	70 dB (DIN)
Channel Separation	40 dB (DIN) 50 dB (at 1 kHz)
Cross Talk	60 dB (DIN)
Wow & Flutter	0.05% (WRMS), ±0.15% (DIN-WTD)

PHONO SECTION

Turntable System	Direct-drive, Automatic Turntable, Auto start/Auto lead-in, Auto-return, Auto-stop, Repeat play, Auto-speed select, Auto-size select, Record presence detection
Turntable Platter	Aluminum die-cast, Diameter 30 cm (12")
Turntable Speed	33-1/3 rpm and 45 rpm Auto-speed select (Manual selection possible)
Phono-Motor	Brushless DC motor
Wow and Flutter	0.08% (WRMS), ±0.1% (DIN WTD)
Tonearm Type	Linear tracking tonearm 4-pivot gimbal suspension
Tonearm Drive Motor	Coreless DC motor
Cartridge	Moving-magnet stereo cartridge (EPC-76SMAD)
Stylus	Block diamond tip, (EPS-76STSD)
Stylus Pressure Range	1.5 ~ 2.5 g
Frequency Response	20 Hz to 20 kHz
Channel Separation	20 dB (DIN)
Signal/Noise Ratio	65 dB (DIN-B)

POWER CONSUMPTION	280 W
POWER SUPPLY	AC 110 V, 120 V, 220 V, 240 V, 50/60 Hz
DIMENSIONS (W x H x D)	375 x 286 x 390 mm
WEIGHT	14.2 kg

* Specifications are subject to change without notice for further improvement.

National Panasonic

Matsushita Electric Trading Co., Ltd.
P. O. Box 288, Central Osaka, Japan

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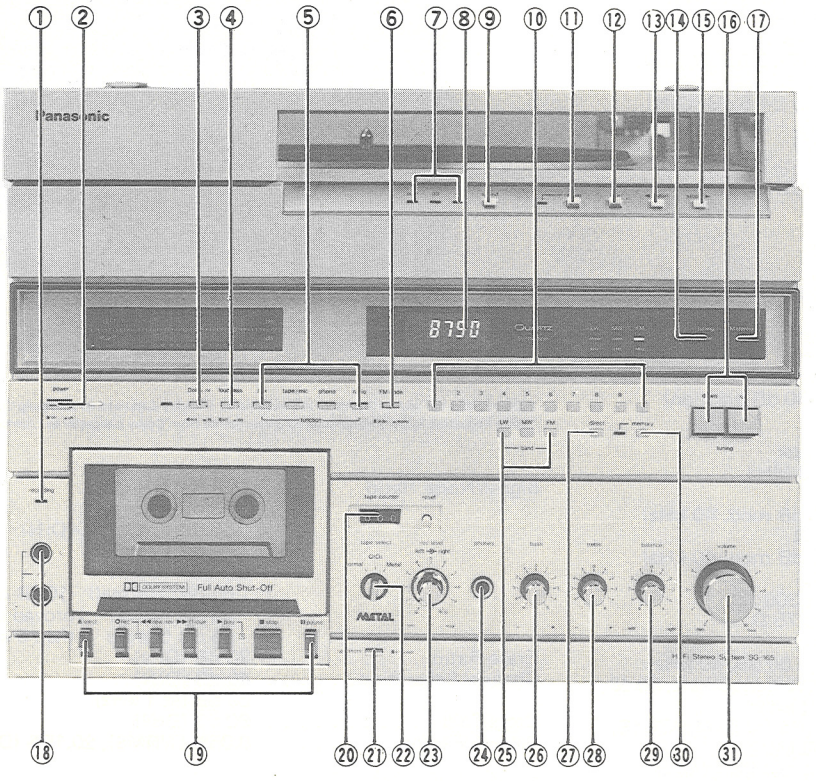
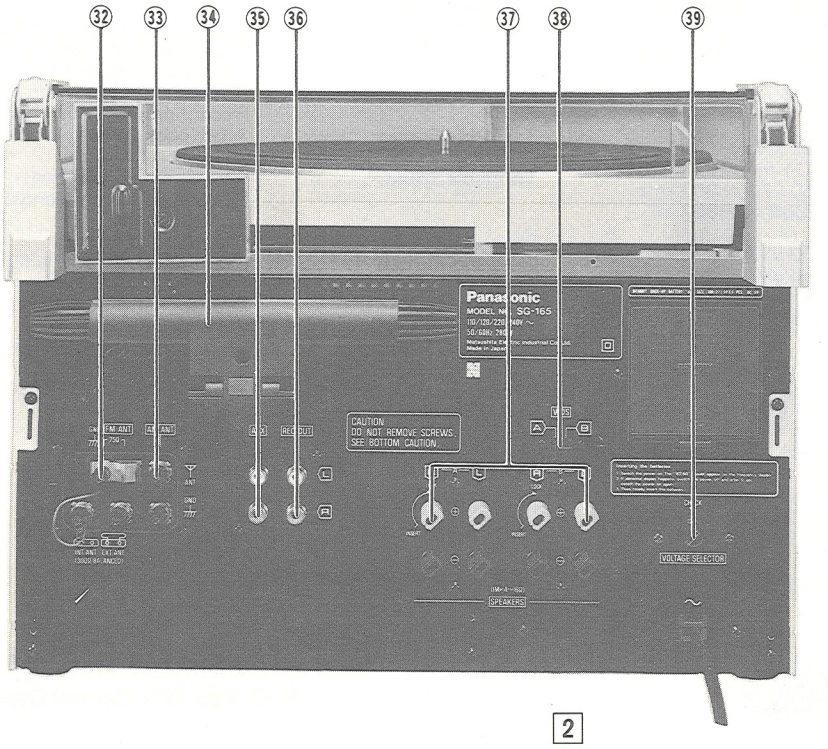
SG-165 (UK)

LOCATION OF CONTROLS

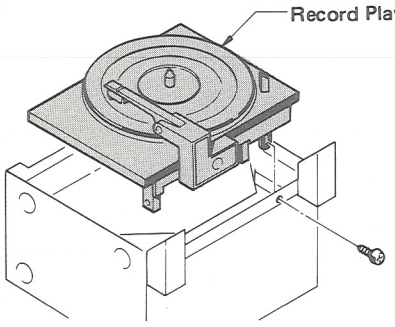




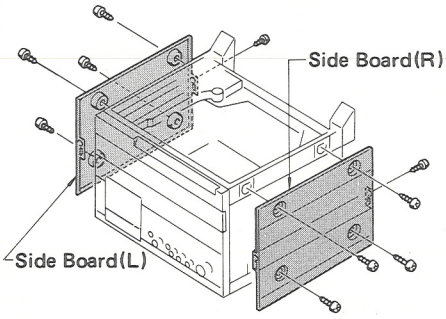
① Recording Indicator
② Power Switch
③ Dolby nr Switch
④ Loudness Switch
⑤ Function Selector
⑥ FM Mode Switch
⑦ Turntable Speed Indicator
⑧ Frequency Digital Display
⑨ Turntable Speed Selector
⑩ Digit Keyboard
⑪ Repeat Button
⑫ Cue Button
⑬ Start Button
⑭ Tuning Indicator
⑮ Stop Button
⑯ Tuning Button
⑰ FM Stereo Indicator
⑱ Mic Jacks
⑲ Cassette Deck Button
⑳ Tape Counter
㉑ Speaker Selector
㉒ Tape Selector
㉓ Rec Level Control
㉔ Headphone Jack
㉕ Band Selector
㉖ Bass Control
㉗ Direct Tuning Button
㉘ Treble Control
㉙ Balance Control
㉚ Memory Button
㉛ Volume Control
㉜ EXT FM ANT
㉝ EXT AM ANT
㉞ AM Ferrite ANT
㉟ AUX Jacks
㊱ Rec Out Jacks
㊲ Speaker Jacks
㊳ W.D. Switch
㊴ Voltage Selector

DISASSEMBLY INSTRUCTIONS

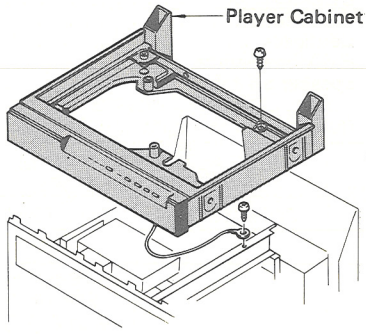
❶ Remove Dust Cover
❷ Remove Record Player



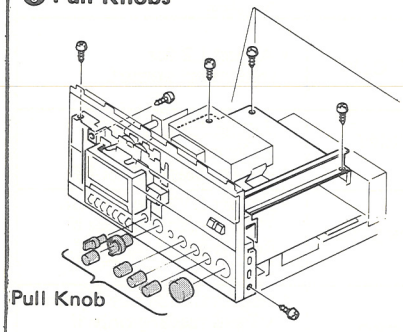
❸ Remove Side Boards



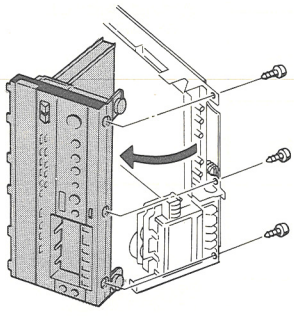
❹ Remove Player Cabinet



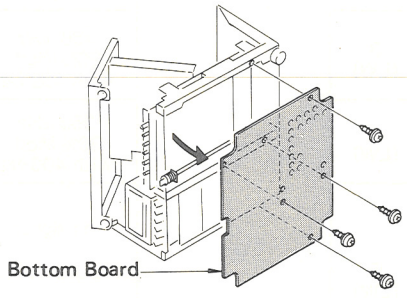
❺ Remove Screw-1
❻ Pull Knobs



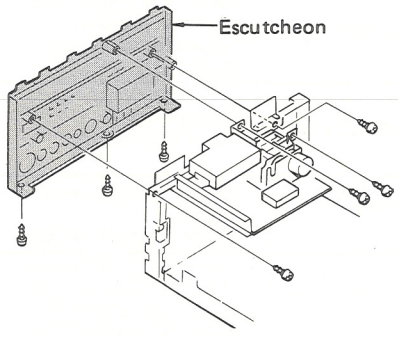
❼ Remove Screw-2



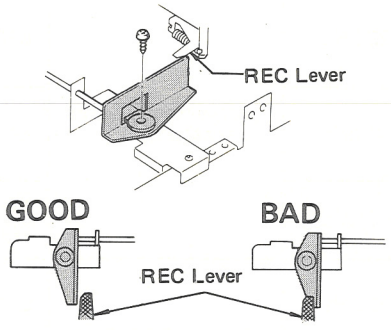
❽ Remove Bottom Board



❾ Remove Escutcheon

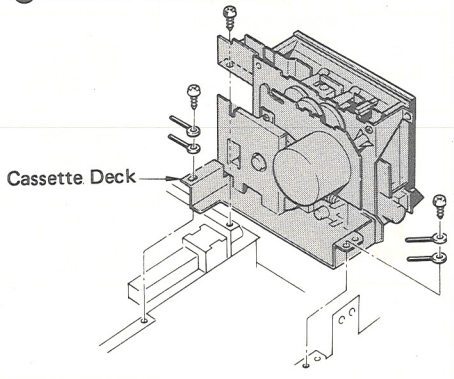


❿ Remove REC Lever



Re-Installation

⓫ Remove Cassette Deck



- **To Remove Record Player** . . . . . .Refer to ❶, ❷.
- **To Replace Parts on P. C Board**
  - **RF P. C. Board** . . . . . .Refer to ❶ ~ ❼.
  - **AF P. C. Board** . . . . . .Refer to ❶ ~ ❽.
- **To Replace Escutcheon** . . . . . .Refer to ❶ ~ ❹, ❾.
- **To Remove Cassette Deck** . . . . . .Refer to ❶ ~ ❻, ❾, ❿, ⓫.

ALIGNMENT INSTRUCTIONS(RADIO-1)

■ AM Alignment

Control Positions:
1. Volume Control . . . . . Center (AM-IF, RF, FM-RF), Minimum (FM-IF)
2. Band Selector . . . . . LW, MW, FM and Direct
3. Radio Switch . . . . . ON
4. Loudness . . . . . OFF
5. FM Mode Switch . . . . . FM MONO and FM AUTO
6. Speaker Switch . . . . . A
7. Output of signal generator should be no higher than necessary to obtain output reading.
8. Make certain that speaker system is connected to the receiver when aligning. (or use 4Ω dummy load resistors.)

STEP	SIGNAL GENERATOR OR SWEEP GENERATOR		DISPLAY	INDICATOR (VTVM or SCOPE)	ADJUST	REMARKS
	CONNECTION	FREQUENCY				
AM-IF AND RF ALIGNMENT						
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	468 kHz 30% Mod. with 400 Hz	Point of non-interference	Output meter across speaker jack (L). (Imp. 4Ω)	T203 (1st IFT) T204 (2nd IFT) T205 (3rd IFT)	• Adjust for maximum output.
2 (LW)		137 kHz 30% Mod. with 400 Hz	137 kHz		L103 (LW OSC Coil)	• Set CT102 and CT104 to center position. • Adjust for maximum output.
3 (LW)		150 kHz 30% Mod. with 400 Hz	150 kHz		L2 (LW ANT Coil)	• Adjust L2 for maximum output.
4 (LW)		350 kHz 30% Mod. with 400 Hz	350 kHz		CT102 (LW ANT Trimmer)	• Adjust for maximum output. • Repeat steps (2) & (3).
5 (LW)		no signal	137 kHz	Connect DC VTVM between TP103 and TP104 (Earth).	L103 (LW OSC Coil)	• Adjust L103 for 1V on VTVM reading only if TP103 is less than 1V. • Repeat steps (3) & (4).
		no signal	350 kHz		CT104 (LW OSC Trimmer)	• Adjust CT104 for 9V on VTVM reading only if TP103 more than 9V (on VTVM reading). • Repeat steps (2),(3) & (4).
6 (MW)		520 kHz 30% Mod. with 400 Hz	520 kHz	Output meter across speaker jack (L).	L102 (MW OSC Coil)	• Set CT101 and CT103 to center position. • Adjust for maximum output.
7 (MW)		520 kHz 30% Mod. with 400 Hz	550 kHz		L1 (MW ANT Coil)	• Adjust L1 for maximum output.
8 (MW)		1500 kHz 30% Mod. with 400 Hz	1500 kHz		CT101 (MW ANT Trimmer)	• Adjust for maximum output. • Repeat steps (7) & (8).
9 (MW)		no signal	520 kHz	Connect DC VTVM between TP103 and TP104 (Earth).	L102 (MW OSC Coil)	• Adjust L102 for 1V on VTVM reading only if TP103 is less than 1V. • Repeat steps (7) & (8).
		no signal	1500 kHz		CT103 (MW OSC Trimmer)	• Adjust CT103 for 9V on VTVM reading only if TP103 more than 9V (on VTVM reading). • Repeat steps (6),(7) & (8).
FM-IF ALIGNMENT						
1	High side through 1 pF between point TP101 and TPE (Earth).	10.7 MHz (400 kHz SWP)	Point of non-interference	Connect vert. amp input of scope between point TP206 and TP204 (Earth)	L3 (FM Tuner Pack)	• Adjust L3 for maximum amplitude and symmetrical curve.
2	No connection	no signal	Free	Connect DC VTVM between TP201 and TP202	T201 (FM Disc)	• Adjust T201 for 0 mV on VTVM reading.

NOTE: As three output readings will be present, adjustments must be made at center frequency.

ALIGNMENT INSTRUCTIONS(RADIO-2)

■ FM-IF Alignment

STEP	SIGNAL GENERATOR		DISPLAY	INDICATOR (VTVM or SCOPE)	FM MODE SWITCH	ADJUST	REMARKS
	CONNECTION	FREQUENCY					
FM MONO DISTORTION ALIGNMENT							
1	Connect to EXT. FM antenna terminal through dummy antenna.	98 MHz 100% Mod. with 400 Hz	98 MHz	Distortion meter to speaker jack (L). (Imp. 4Ω)	MONO	T202 (FM Disc)	Adjust for minimum distortion meter indication.

■ FM Stereo Alignment

FREE RUN ALIGNMENT		
EQUIPMENT CONNECTION	ADJUST	REMARKS
Connect frequency counter to TP301 and TP302 (Earth) at 98 MHz, non modulation with 60 dB input.	VR302	Adjust VR302 for 19 kHz ±50 Hz on frequency counter reading.

SEPARATION ALIGNMENT

NOTES:
1. Stereo Modulator: Connect Stereo Modulator to EXT, Mod. terminal of signal generator.
2. Signal Generator: Modulation Rate of 19 kHz Pilot Signal 9%
   Modulation Rate of Right and Left Signal . . . . . 30% (1 kHz)
   Output Level . . . . . 60 dB
3. Tuner (Balance Control): Adjust balance control so that output level from both channels becomes equal.

EQUIPMENT CONNECTION			ADJUST	REMARKS
SIGNAL GENERATOR	VRVM	OSCILLOSCOPE		
Connect to EXT. FM antenna terminal through dummy antenna.	Connect across speaker jack. (Imp. 4Ω)	Connect vertical amp. input of scope to terminals of VTVM.	VR301 (Separation Control)	Adjust VR301 for minimum indication of VTVM from the left side output when the right side of stereo modulation is modulated. Adjust VR301 in the same way for the right side. Adjust for best balance between "L to R" and "R to L" separation.

NOTE: When aligning separation, disconnect frequency counter.

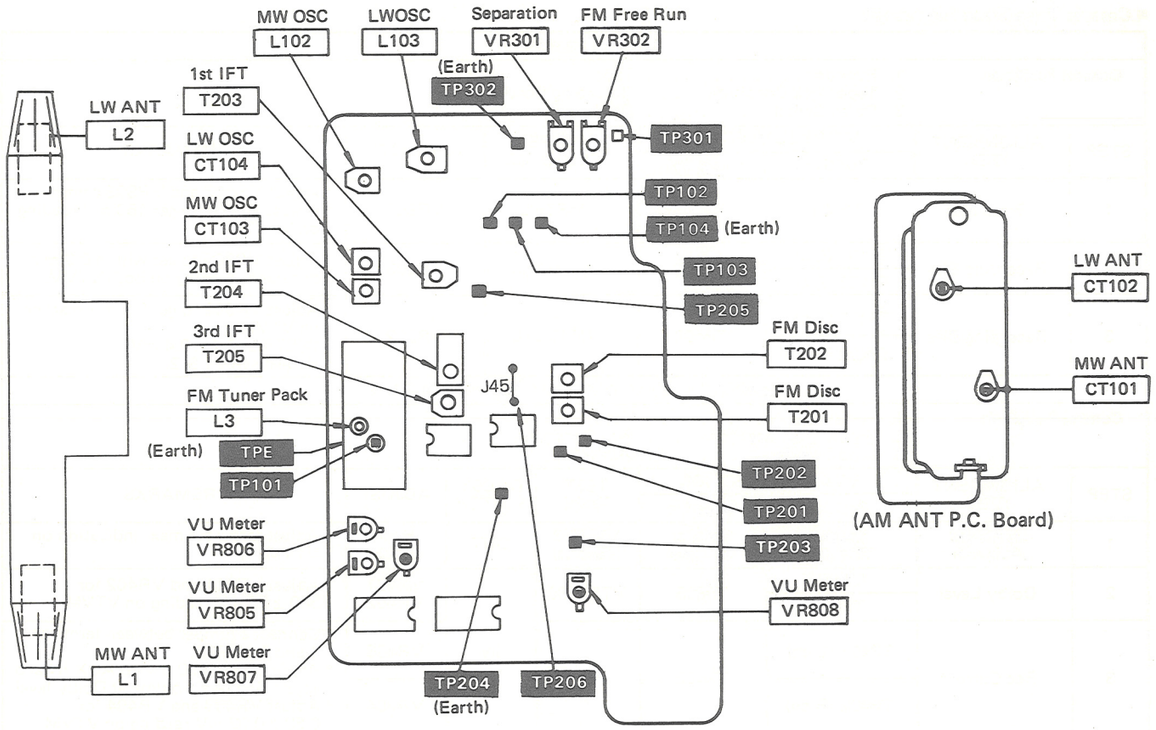
■ VU Meter Alignment

STEP	VTVM CONNECTION		TAPE DECK CONDITION	DOLBY NR SWITCH	ADJUST	REMARKS
	Positive	Negative				
1	TP803 TP804	TP805	Recording	IN	REC Volume	• Apply 150 mV, 1 kHz to AUX. • Adjust Rec Volume to get 580 mV reading on VTVM.
2	No connection			IN	VR807 VR808	• Adjust VR807 and VR808 to light at +2 dB (DD mark).
3	No connection			IN	VR805 VR806	• Attenuate the applied signal by −20 dB, then adjust VR805 and VR806 to light at −18 VU. • Repeat Steps 2 and 3.

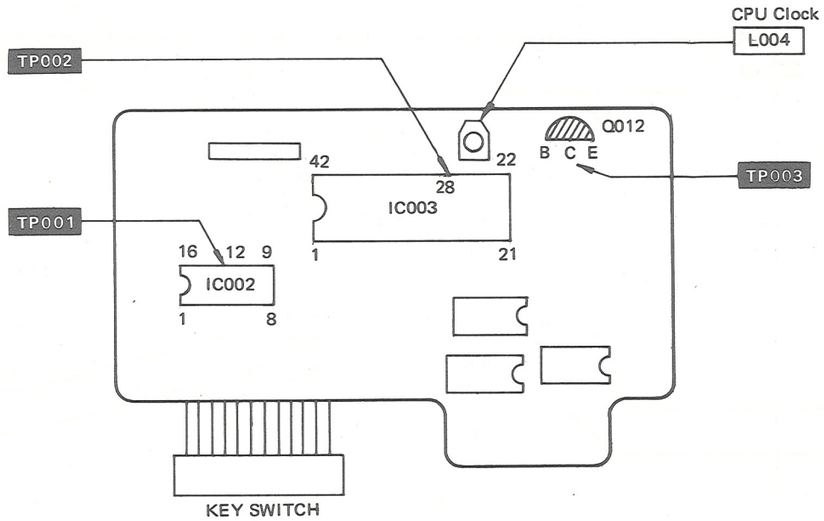
■ Synthesizer Alignment

	SYNTHESIZER ALIGNMENT				
STEP	ALIGNMENT ITEM	COUNTER CONNECTION		ADJUST	REMARKS
		Positive	Negative		
1	PLL Standard OSC	TP001 (pin 12 of IC002)	Shield Case	–	• Connect frequency counter between TP001 and shield case. • Confirm that the frequency is 100 kHz ±0.9 Hz.
2	CPU Clock Frequency	TP002 (pin 28 of IC003)	"	L004	• Connect frequency counter between TP002 and shield case. • Confirm that the frequency is 150 kHz ~ 200 kHz, and adjust L004 to count 200 kHz when the frequency is beyond 200 kHz.
		TP003 (Q012 collector)	"	–	• Connect frequency counter between TP003 and shield case. • Confirm that the frequency is 250 Hz ~ 300 Hz.
3	FM Frequency Band Width	.....	.....	.....	• Confirm that the frequency display becomes "108.00" MHz by calling "87.5" MHz and pushing "DOWN" key SW once.
					• Confirm that the frequency display becomes "87.5" MHz by calling "108.00" MHz and pushing "UP" key SW once.
					• Confirm that the frequency display becomes "000.00—turn on and off—effor display" by calling the other frequencies beside "87.5" MHz ~ "108.00" MHz.

ALIGNMENT POINTS(RADIO)



(RF P.C. Board)



(Synthesizer P.C. Board)

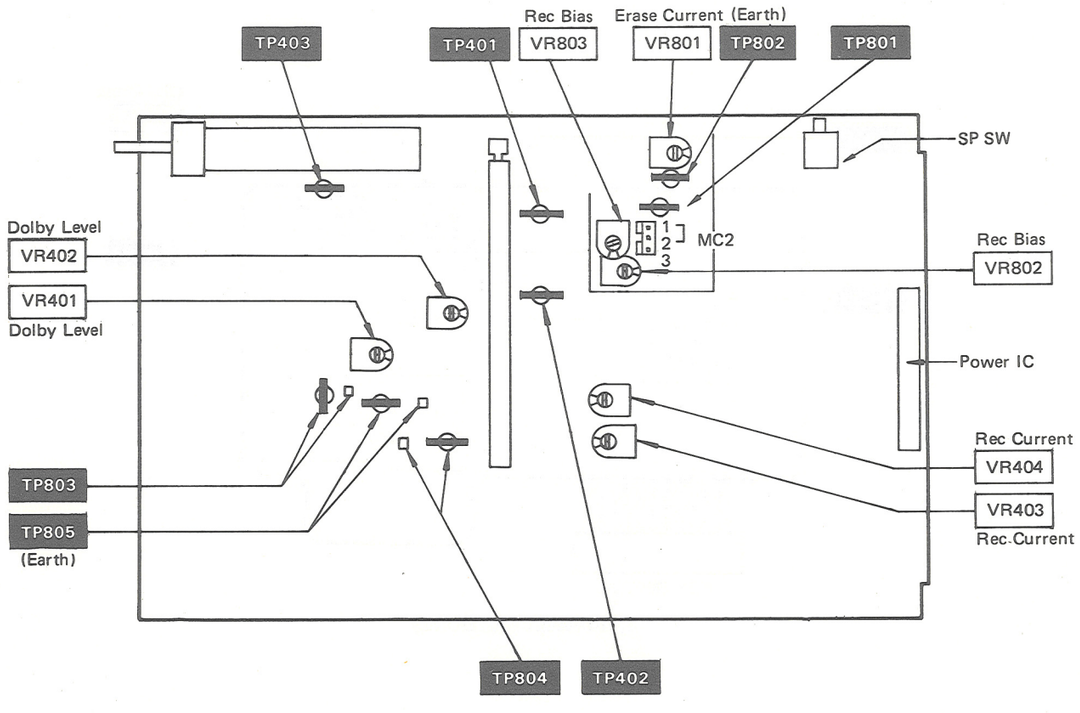
ALIGNMENT INSTRUCTIONS(CASSETTE TAPE DECK)

■ **Cassete Tape Deck Alignment**

BIAS ALIGNMENT						
Control Positions:	1. Function . . . . . Tape 2. Tape Deck Condition. . . . . Recording Condition 3. Dolby Switch . . . . . OUT					
STEP	ALIGNMENT ITEM	VTVM CONNECTION Positive	VTVM CONNECTION Negative	TAPE SELECTOR	ADJUST	REMARKS
1	Erase Bias	TP801	TP802	METAL	VR801	• Adjust VR802 and VR803 center. • Adjust VR801 to get 150 mV reading on VTVM.
2	Recording Bias	TP401 (L ch) TP402 (R ch)	TP403	NORMAL	VR803	• Adjust VR803 to get within 0.3 mV difference reading on both VTVM.
3	Recording Bias	TP401 (L ch) TP402 (R ch)	TP403	NORMAL	VR802	• Adjust VR802 to get 3.8 mV reading on VTVM. (METAL: 9.4 ± 0.4 mV) • Repeat steps 1 & 2.

AZIMUTH, DOLBY, REC CURRENT ALIGNMENT							
Control Positions:	1. Function . . . . . Tape 2. Tape Deck Condition. . . . . Play Condition 3. Tape Selector . . . . . NORMAL						
STEP	ALIGNMENT ITEM	VTVM CONNECTION Positive	VTVM CONNECTION Negative	TEST TAPE	DOLBY SWITCH	ADJUST	REMARKS
1	R/P Head Azimuth	Speaker Terminal	Speaker Terminal	VTT653 (10 kHz)	OUT	Head Screw	• Adjust screw for max. indication on VTVM.
2	Dolby Level	TP803 TP804	TP805	VTT6130	IN	VR401 VR402	• Adjust VR401 and VR402 for 580 ± 20 mV reading on VTVM.
3	Rec Current	TP401 (L ch) TP402 (R ch)	TP403	.....	IN	VR403 VR404	• Connect a jumper between terminal 1 and 2 of MC2. • Apply 1 kHz, 150 mV to AUX IN and adjust Rec level volume at Dolby level. • Adjust VR403 and VR404 for 0.58 ± 0.02 mV reading on VTVM.

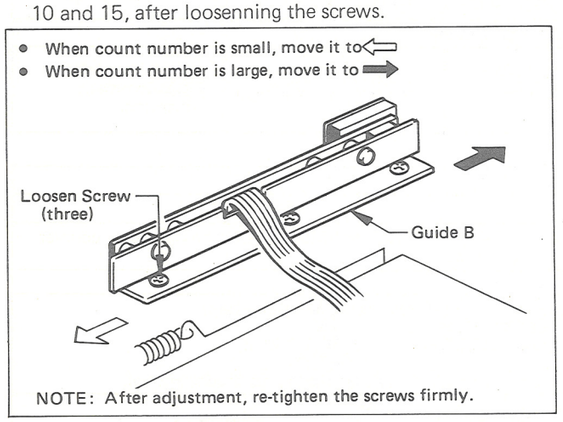
ALIGNMENT POINTS(CASSETTE TAPE DECK)



SEVICING THE RECORD PLAYER

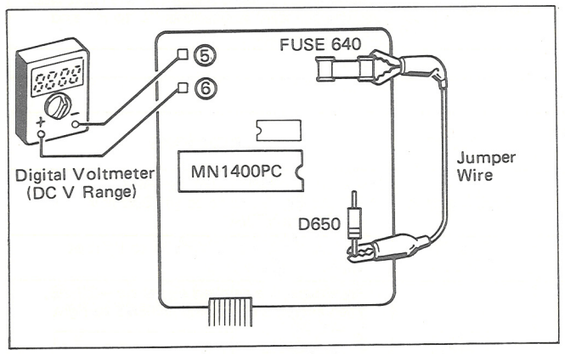
■ STYLUS DROP POINT ADJUSTMENT

Move the guide B so that read-in position is set between 10 and 15, after loosenning the screws.

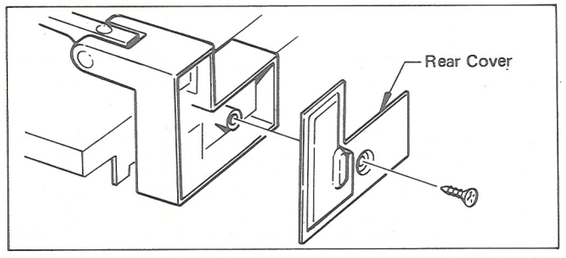


■ TONEARM COUPLER POINT ADJUSTMENT

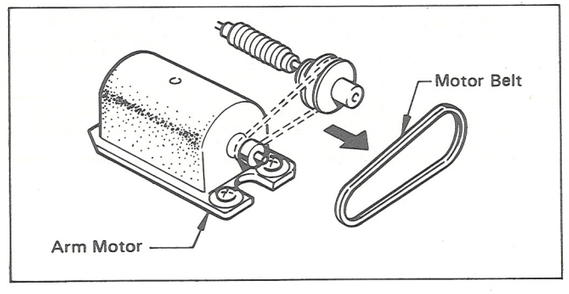
1. Connect the digital voltmeter and the jumper wire.



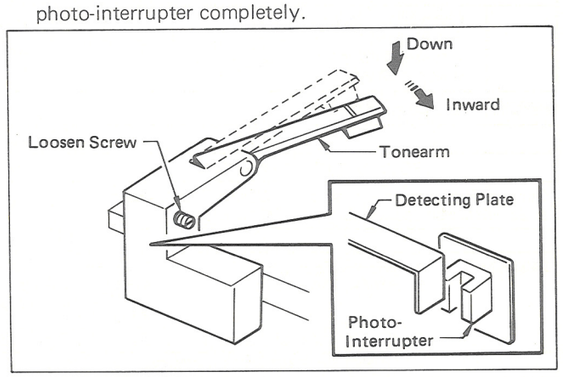
2. Remove the rear cover of PU ass'y.



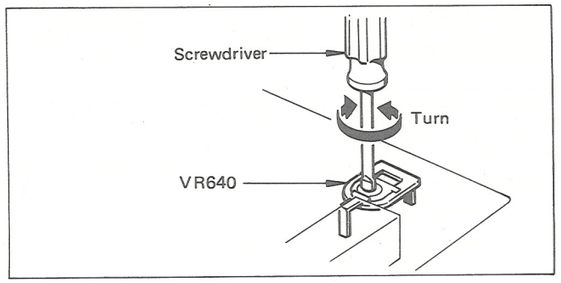
3. Remove the motor belt.



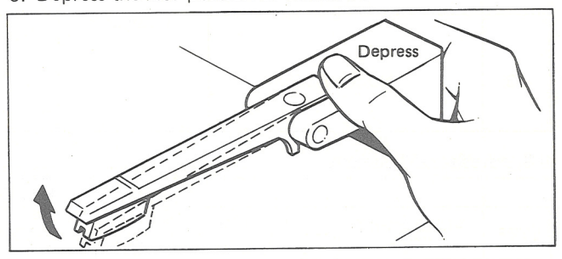
4. Remove the stylus.
   Loosen the mounting screw, and then forcibly push the tonearm down and turn it to inward.
   Confirm that the detecting plate is escaped from the photo-interrupter completely.



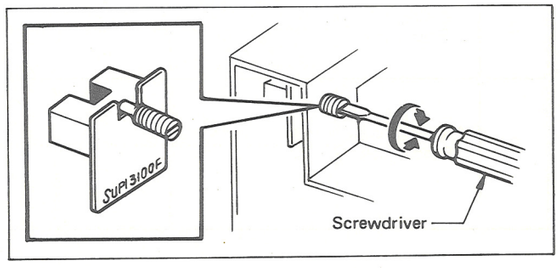
5. Re-install the rear cover of PU ass'y.
   Adjust the semi-fixed resistor (VR640) for 2 V ± 0.2 V.



6. Depress the rear portion of tonearm.

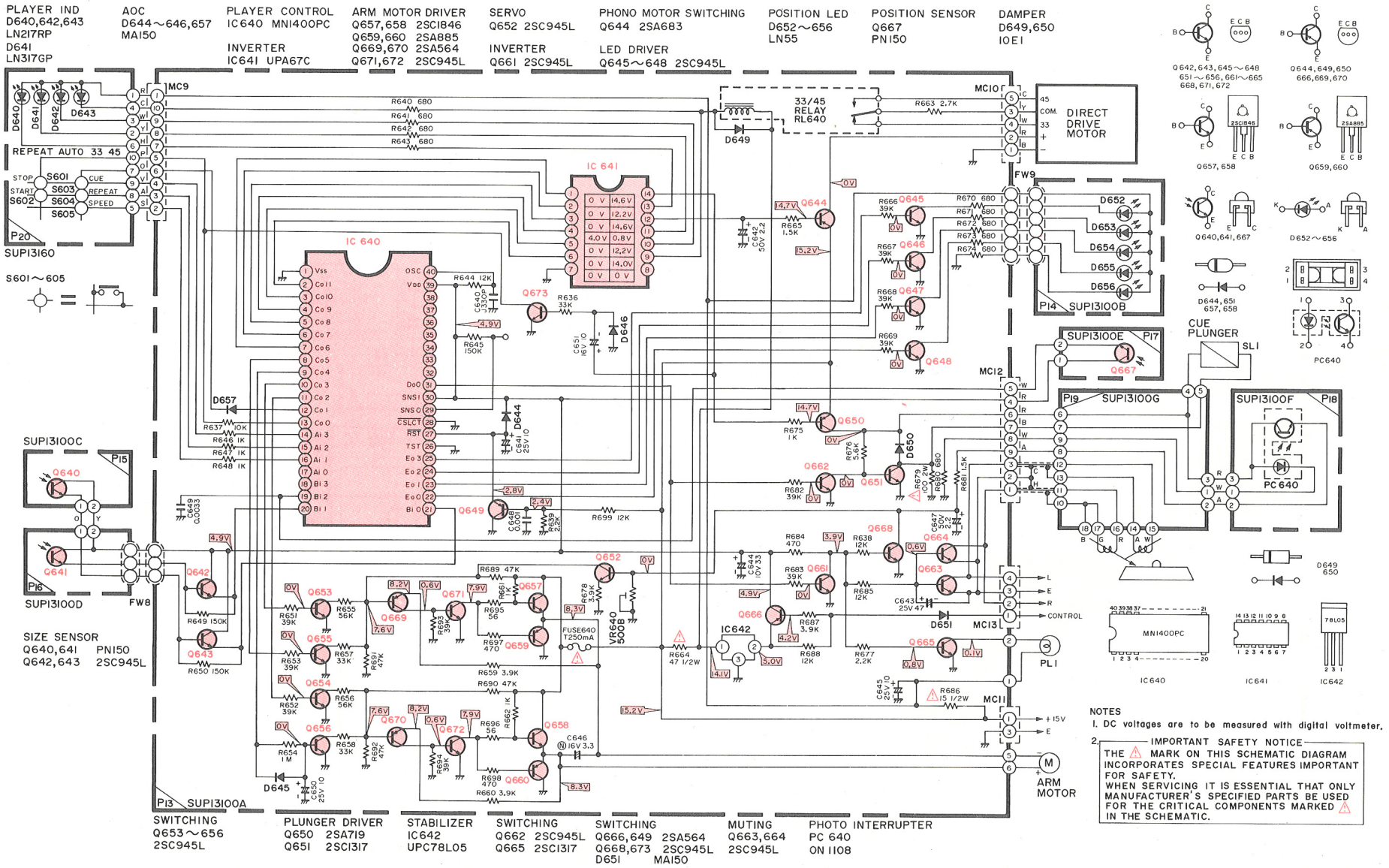


7. Adjust the mounting screw for 0.1 V ~ 0.15 V.
   Confirm that the screw is inserted in the ⊏⊐ point of P.C. board.



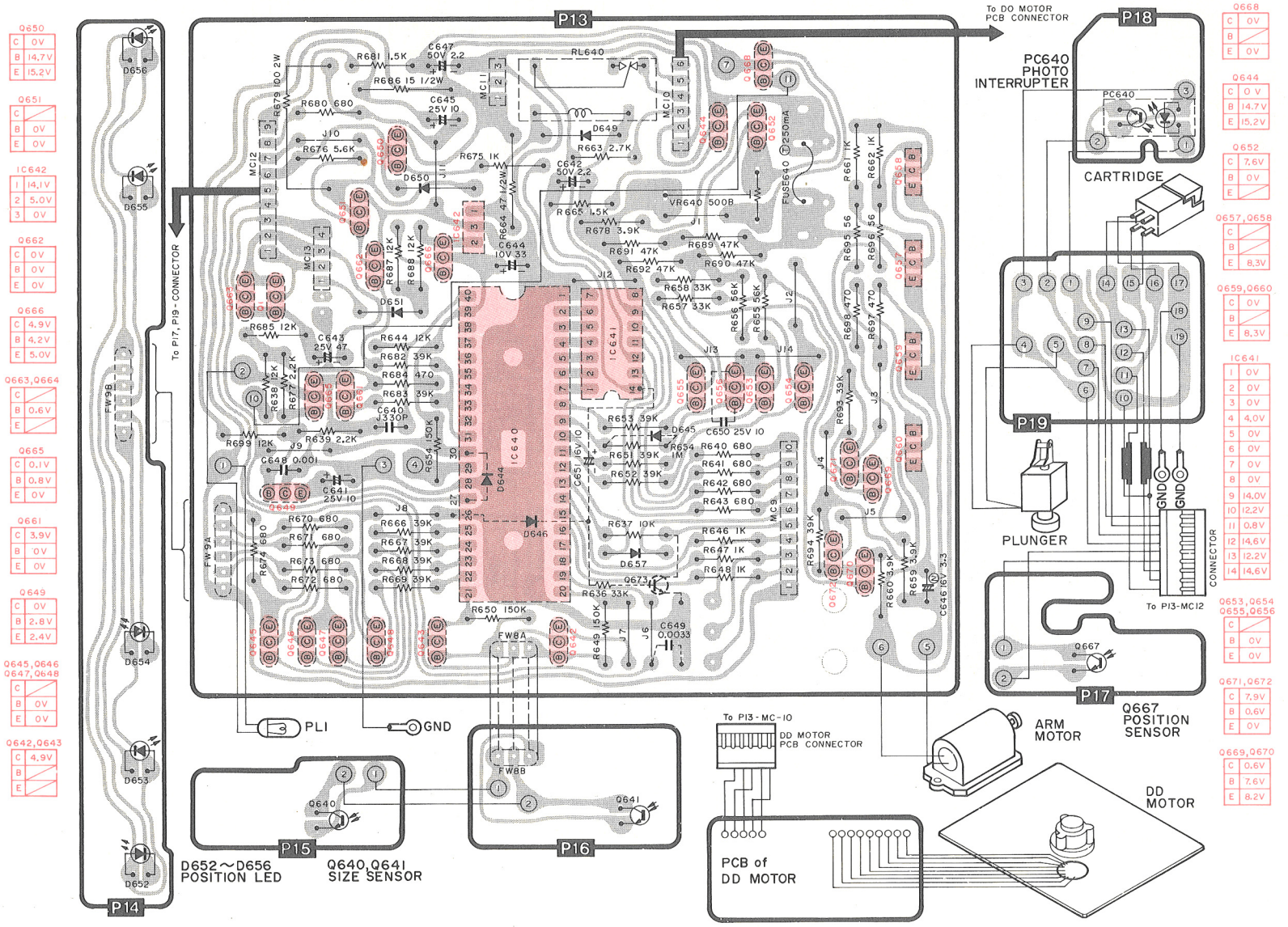
8. Paint-lock the mounting screw.
9. Disconnect the digital voltmeter and the jumper wire.
10. Re-install the drive belt.

SCHEMATIC DIAGRAM OF RECORD PLAYER(SP-622A)



*This diagram might be modified without notice for further development of technology.

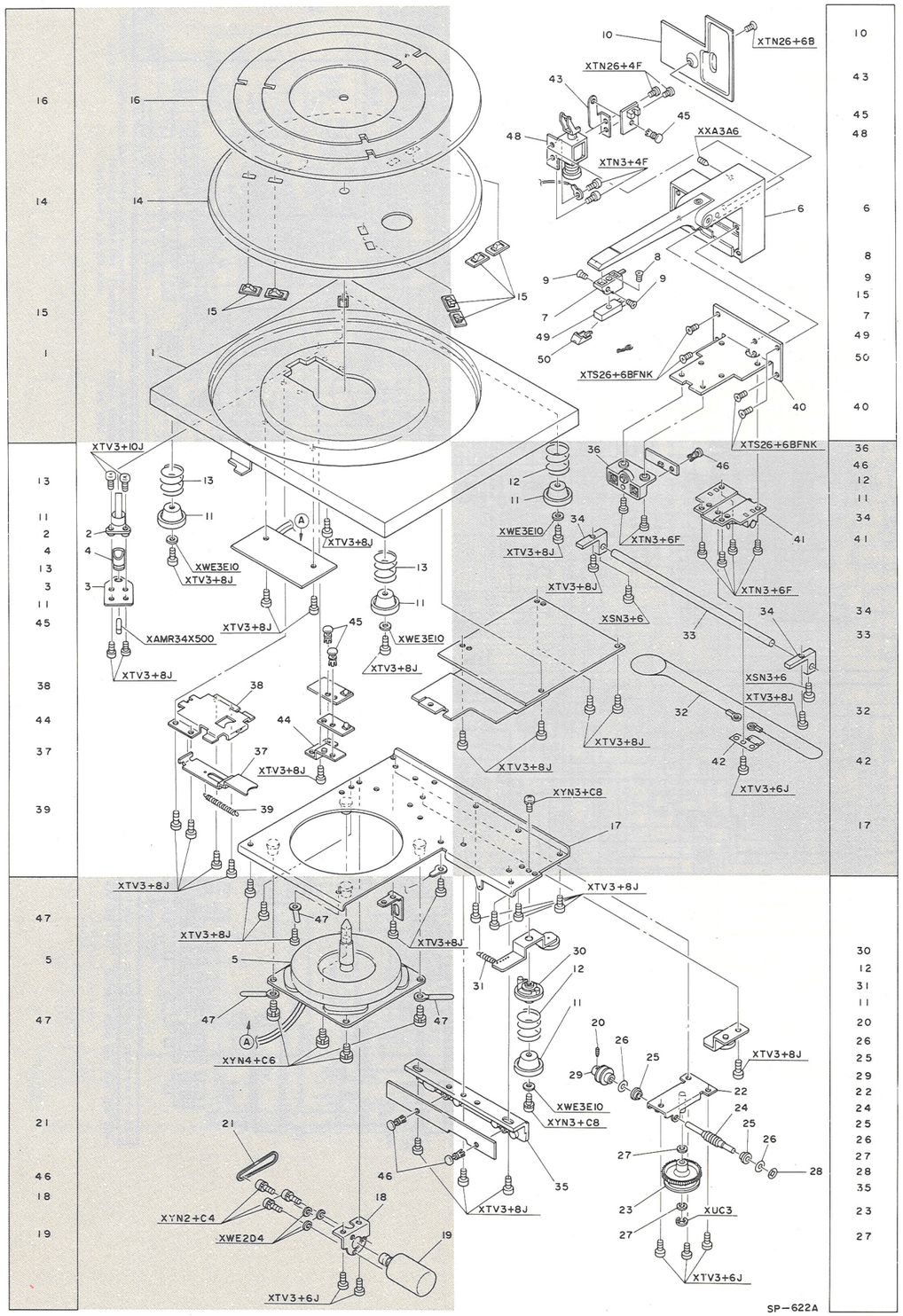
CIRCUIT BOARD AND WIRING CONNECTION OF RECORD PLAYER (SP-622A)



*This diagram might be modified without notice for further development of technology.

10

EXPLODED VIEW OF RECORD PLAYER(SP-622A)

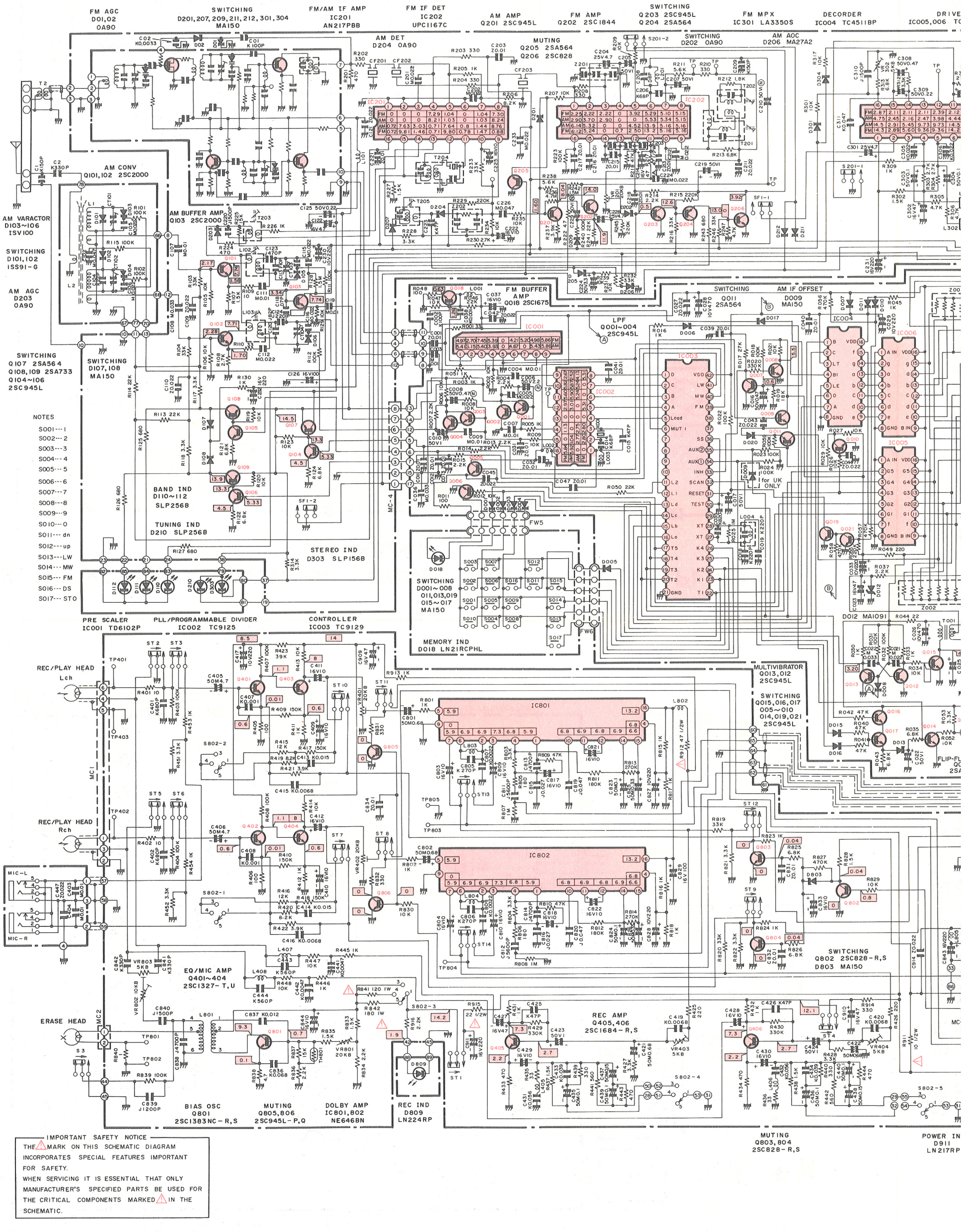


REPLACEMENT PARTS LIST OF RECORD PLAYER(SP-622A)

Ref. No.	Part No.	Description	Per Set (pcs.)
1	SJY332	Player Board Ass'y	1
2	SJY9774	Reflector	1
3	SJY9776	Lamp Bracket	1
4	SHG9176	Rubber	1
5	DFX90A2C	DD Motor	1
6	SJY334	Tone Arm Ass'y	1
6-1	XXA3A6	Adjust Screw	1
7	SJY9782	Spacer	1
8	XSS2+6	Screw	1
9	XSS2+4FX	Ornament Screw	2
10	SJY9806	Rear Cover	1
11	SJY9244	Rubber Cusion	4
12	SJY9714-1	Spring	2
13	SJY9716-1	Spring	2
14	SJY3028	Turntable	1
15	SJY9808	Accepter	6
16	SJY4040	Turntable Mat	1
17	SJY336	Base Plate Ass'y	1
18	SJY9910	Motor Bracket	1
19	KCN165	Motor Ass'y	1
20	XXA2D3	Screw	2
21	SJY9818	Turntable Belt	1
22	SJY338	Worm Gear Ass'y	1
23	SJY9824	Drum	1
24	SJY340	Wrom	1
25	SJY9830	Shaft Bracket	2
26	SNW212	Poly Washer	2
27	SNW412-2	Poly Washer	2
28	SNE468	Speed Nut	1
29	SJY9832	Pulley	1
30	SJY9838	Spacer	1
31	SUS384	Tension Spring	1
32	SJY9842	Drive Rope	1
33	SJY9844	Guide Bar	1
34	SJY9846	Guide Bar Bracket	2
35	SJY9848	Guide B	1
36	SJY9850	Holder	1
37	SJY9778	Reset Lever	1
38	SJY9780	Lever Bracket	1
39	SUS180	Spring	1
40	SJY9854	Movement	1
41	SJY9856	Slider	1
42	SJY9858	Spring	1
43	SJY9860	Sensor Bracket	1
44	SJY9800	PCB Bracket	1
45	RHR969ZA	Latch	3
46	SHR9094	Latch	3
47	SHE84	Cord Clamper	4
48	SJY9862	Plunger	1
49	EPC76SMAD	Cartridge	1
50	EPS76STSD	Stylus	(1)

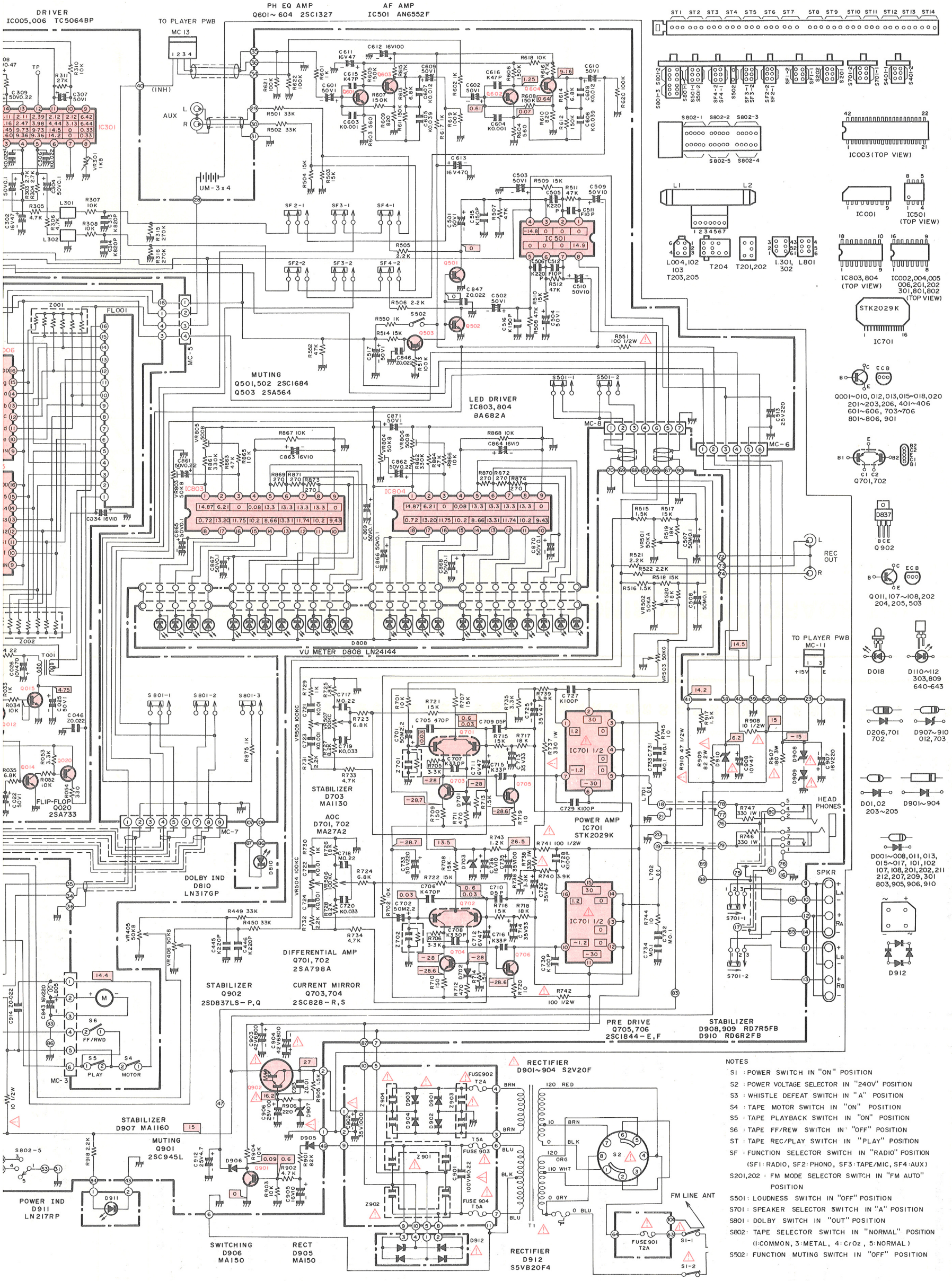
Ref. No.	Part No.	Discription	Per Set (pcs.)
TRANSISTORS			
Q640, 641	PN150	Size Sensor	2
Q642, 643	2SC945L	Size Sensor	2
Q644	2SA683	Phono Motor Switching	1
Q645, 646	2SC945L	LED Driver	2
Q647, 648	2SC945L	LED Driver	2
Q649	2SA666AI	Switching	1
Q650	2SA719-S	Plunger Driver	1
Q651	2SC1317-S	Plunger Driver	1
Q652, 653	2SC945L	Servo, Switching	2
Q654, 655	2SC945L	Switching	2
Q656	2SC945L	Switching	1
Q657, 658	2SC1846-R	Arm Motor Driver	2
Q659, 660	2SA885Q	Arm Motor Driver	2
Q661, 662	2SC945L	Inverter, Switching	2
Q663, 664	2SC945L	Muting	2
Q665	2SC1317-S	Switching	1
Q666	2SA666AI-R	Switching	1
Q667	PN150	Position Sensor	1
Q668	2SC945L	Switching	1
Q669, 670	2SA666AI-R	Arm Motor Driver	2
Q671, 672	2SC945L	Arm Motor Driver	2
Q673	2SC945L	Switching	1
INTEGRATED CIRCUITS			
IC640	MN1400PC	Player Control	1
IC641	UPA67C	Inverter	1
IC642	UPC78L05	Stabilizer	1
DIODES			
D644, 645	MA161	AOC	2
D646	MA161	AOC	1
D649, 650	SM112	Damper	2
D651	MA161	Switching	1
D652, 653	LN55	Position LED	2
D654, 655	LN55	Position LED	2
D656	LN55	Position LED	1
D657	MA161	Position Sensor	1
VARIABLE RESISTORS			
VR640	EVTS3MA00B52	Preset 500Ω B	1
LAMPS AND FUSES			
PL1	XAMR34X500-1	Lamp	1
F640	XBA2C025TR0	Fuse, T250 mA	1

SCHEMATIC DIA



* This diagram might be modified without notice for further development of technology.

C DIAGRAM

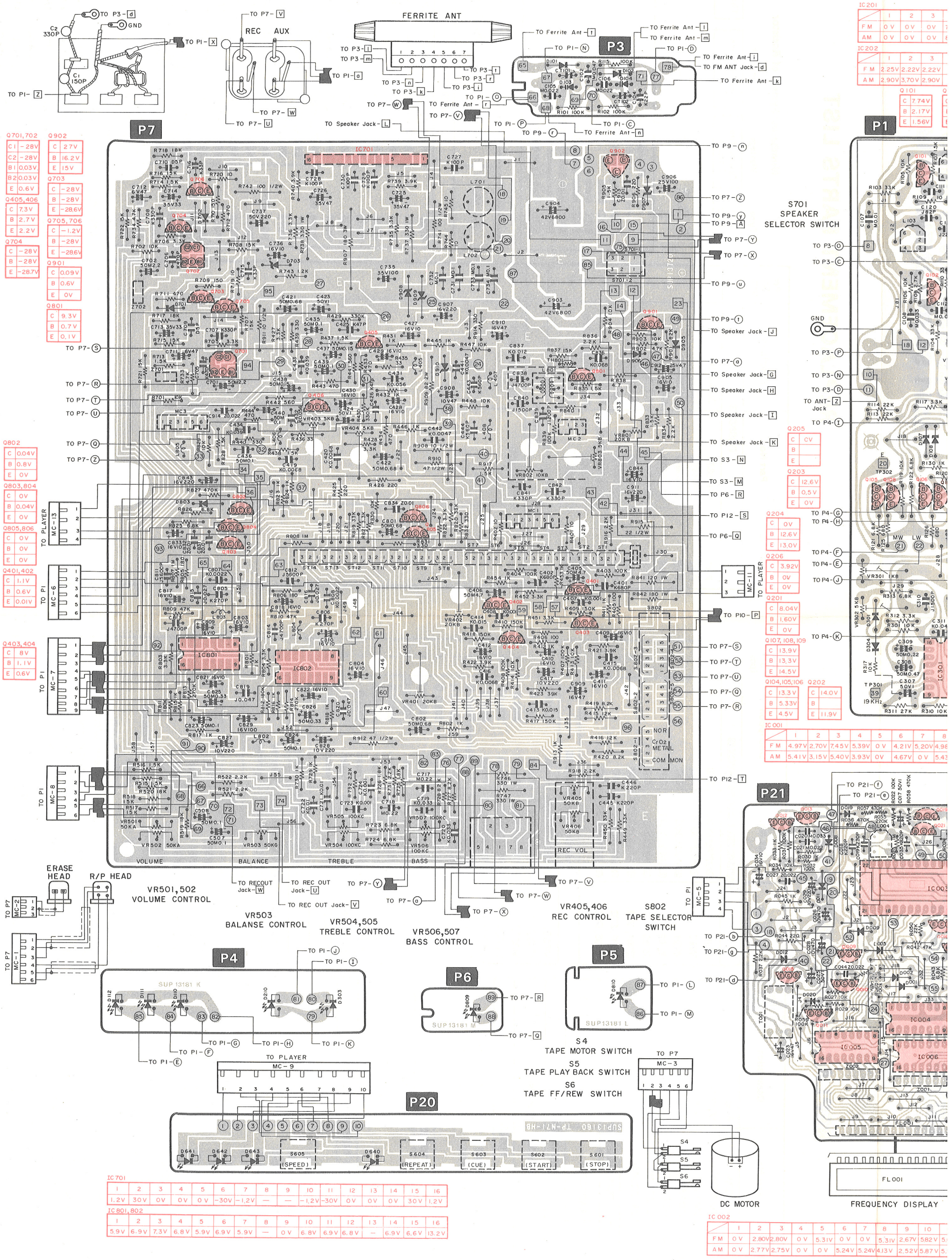


NOTES

- S1 : POWER SWITCH IN "ON" POSITION
- S2 : POWER VOLTAGE SELECTOR IN "240V" POSITION
- S3 : WHISTLE DEFEAT SWITCH IN "A" POSITION
- S4 : TAPE MOTOR SWITCH IN "ON" POSITION
- S5 : TAPE PLAYBACK SWITCH IN "ON" POSITION
- S6 : TAPE FF/REW SWITCH IN "OFF" POSITION
- ST : TAPE REC/PLAY SWITCH IN "PLAY" POSITION
- SF : FUNCTION SELECTOR SWITCH IN "RADIO" POSITION (SF1: RADIO, SF2: PHONO, SF3: TAPE/MIC, SF4: AUX)
- S201,202 : FM MODE SELECTOR SWITCH IN "FM AUTO" POSITION
- S501 : LOUDNESS SWITCH IN "OFF" POSITION
- S701 : SPEAKER SELECTOR SWITCH IN "A" POSITION
- S801 : DOLBY SWITCH IN "OUT" POSITION
- S802 : TAPE SELECTOR SWITCH IN "NORMAL" POSITION (1:COMMON, 3:METAL, 4:CrO2, 5:NORMAL)
- S502 : FUNCTION MUTING SWITCH IN "OFF" POSITION

SCHEMATIC DIAGRAM MODEL NO.SG-165

CIRCUIT BOARD AND WIR


P7
P3
P1
P21
P20
P4
P5
P6
TO P3-d
GND
C2 330P
C1 150P
TO PI-Z
TO PI-X
TO P7-V
REC AUX
TO P7-W
TO P7-U
TO PI-a
FERRITE ANT
1 2 3 4 5 6 7
TO P3-l
TO P3-m
TO P3-n
TO P3-k
TO P3-t
TO P3-r
TO P3-i
TO Ferrite Ant-t
TO PI-N
TO Ferrite Ant-r
TO PI-O
TO P7-W
TO P7-V
TO Speaker Jack-L
TO PI-P
TO P9-r
TO Ferrite Ant-n
TO Ferrite Ant-l
TO Ferrite Ant-m
TO PI-D
TO Ferrite Ant-j
TO FM ANT Jack-d
TO Ferrite Ant-k
TO PI-C
TO P9-n
TO P7-Z
TO P9-y
TO P9-A
TO P7-Y
TO P7-X
TO P9-u
TO P9-t
TO Speaker Jack-J
TO P7-a
TO Speaker Jack-G
TO Speaker Jack-H
TO Speaker Jack-I
TO Speaker Jack-K
TO S3-N
TO S3-M
TO P6-R
TO P12-S
TO P6-Q
TO P10-P
TO P7-S
TO P7-T
TO P7-U
TO P7-Q
TO P7-R
TO P12-T
TO P7-S
TO P7-R
TO P7-T
TO P7-U
TO P7-Q
TO P7-Z
TO P7-Y
TO P7-X
TO P7-W
TO P7-V
TO P7-a
TO P7-Q
TO P7-Z
TO P7-R
TO P7-T
TO P7-U
TO P7-S
TO P7-V
TO P7-W
TO P7-X
TO P7-Y
TO P7-a
TO P7-Q

WIRING CONNECTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
V	0V	0V	7.29V	1.04V	0V	1.04V	7.30V	0.88V	1.47V	0.78V	9.80V	0.71V	1.46V	9.81V	0.72V
V	0V	0V	8.21V	1.03V	0V	1.03V	8.24V	8.76V	1.44V	0.8V	7.64V	0.71V	3.03V	7.63V	0.72V

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
25V	2.22V	2.22V	0V	3.92V	5.29V	5.10V	5.15V	5.16V	5.16V	13.2V	2.50V	0.7V	0V	5.24V	6.12V
90V	3.70V	2.90V	0V	0V	5.53V	5.34V	5.15V	5.16V	5.16V	13.9V	4.52V	0V	0V	5.32V	6.14V

Q101	
C	7.74V
B	2.17V
E	1.56V

Q102	
C	7.71V
B	2.28V
E	1.70V

Q103	
C	7.74V
B	3.34V
E	

VU(LED) METER

SPEAKER JACK

SP(A)

SP(B)

TO P7- I / J / K / L

TO P7- G / H / L / R

TO P2- Y

AC CORD

SI
POWER SWITCH

TO P1- U

TO FM ANT - X

TO P21- y

TO P21- U

TO P9- B / C / D / E / F

POWER TRANSFORMER

SECONDARY

PRIMARY

ANT

S2
VOLTAGE
SELECTOR SWITCH

P2

10 TURN

T2A FUSE901

Black / White / Red / Orange / Blue / Gray / Brown

TO Battery Box- b

TO SI- Y

IC301		
	FM	AM
1	14.3V	14.5V
2	2.89V	2.91V
3	5.60V	5.45V
4	9.36V	9.73V
5	9.36V	9.73V
6	14.2V	14.5V
7	0V	0V
8	0.33V	0.33V
9	6.42V	6.44V
10	2.12V	3.13V
11	2.12V	4.44V
12	2.39V	3.98V
13	2.11V	2.47V
14	2.11V	2.16V
15	2.11V	2.45V
16	2.87V	4.75V

IC803, 804	
1	14.87V
2	6.21V
3	0V
4	0.08V
5	13.3V
6	13.3V
7	13.3V
8	13.3V
9	0V
10	9.43V
11	10.2V
12	11.74V
13	13.31V
14	8.66V
15	10.2V
16	11.75V
17	13.20V
18	0.72V

IC501	
1	0V
2	0V
3	0V
4	-14.8V
5	0V
6	0V
7	0V
8	14.9V

S3
WDS SWITCH

TO P7- M / N

TO P5- M / L

TO P1- B

TO P9- O

BATTERY BOX

TO P1- b

	6	7	8	9
	4.21V	5.20V	4.98V	5.86V
	4.67V	0V	5.43V	5.86V

TO PI

MC-4

1 2 3 4 5 6 7 8

TO PI- U / B / A / y

TO AUX Jack- a

MODE / RADIO / PHONO / TAPE / AUX / LOUDNESS / DOLBY NR

Q601,602	
C	1.25V
B	0.61V
E	0.07V

Q603,604	
C	9.16V
B	1.25V
E	0.64V

Q501,502	
C	0V
B	0V
E	0V

Q503	
C	0V
B	
E	

TO P21- g / b / d / e / f

TO P9- h / i / l / m

P11

P12

TO P7- S / T

P8

SO11
UP SWITCH

SO12
DOWN SWITCH

TO Power Transformer Secondary- E / C / D / B / F

TO P7- y / r / n / A / t / u

TO P11- h / i / l / m

TO Battery Box- O

P9

P10

TO P7- P

MIC JACK

S001~010
PRESET SWITCH

SO13
LW SWITCH

SO14
MW SWITCH

SO15
FM SWITCH

	9	10	11	12	13	14	15	16
3IV	2.67V	5.82V	5.60V	2.97V	0V	1.13V	0V	5.84V
V	2.52V	5.87V	5.90V	3.01V	0V	0V	1.04V	5.92V

MODEL SG-165UK

REPLACEMENT PARTS LIST
RECORD PLAYER(SP-622A)

Ref. No.	Part No.	Description	Per Set (pcs.)
OTHERS			
RL640	SSY8	Relay	1
	SJF110	Fuse Holder	2
PC640	ON1108	Photo Interrupter	1
RESISTORS			
R636	ERD25TJ333	33kΩ 1/4W	1
R637	ERD25FJ103	10kΩ 1/4W	1
R638	ERD25TJ123	12kΩ 1/4W	1
R639	ERD25FJ222	2.2kΩ 1/4W	1
R640, 641	ERD25FJ681	680Ω 1/4W	2
R642, 643	ERD25FJ681	680Ω 1/4W	2
R644	ERD25TJ123	12kΩ 1/4W	1
R645	ERD25TJ154	150kΩ 1/4W	1
R646, 647	ERD25FJ102	1kΩ 1/4W	2
R648	ERD25FJ102	1kΩ 1/4W	1
R649, 650	ERD25TJ154	150kΩ 1/4W	2
R651, 652	ERD25TJ393	39kΩ 1/4W	2
R653	ERD25TJ393	39kΩ 1/4W	1
R654	ERD25TJ105	1MΩ 1/4W	1
R655, 656	ERD25TJ563	56kΩ 1/4W	2
R657, 658	ERD25TJ333	33kΩ 1/4W	2
R659, 660	ERD25FJ392	3.9kΩ 1/4W	2
R661, 662	ERD25FJ102	1kΩ 1/4W	2
R663	ERD25FJ272	2.7kΩ 1/4W	1
R664	ERQ12HJ470	47Ω 1/2W	1
R665	ERD25FJ152	1.5kΩ 1/4W	1
R666, 667	ERD25TJ393	39kΩ 1/4W	2
R668, 669	ERD25TJ393	39kΩ 1/4W	2
R670, 671	ERD25FJ681	680Ω 1/4W	2
R672, 673	ERD25TJ681	680Ω 1/4W	2
R674	ERD25FJ681	680Ω 1/4W	1
R675, 676	ERD25FJ562	5.6kΩ 1/4W	2
R677	ERD25FJ222	2.2kΩ 1/4W	1
R678	ERD25FJ392	3.9kΩ 1/4W	1
R679	ERG2ANJP101S	100Ω 2W	1
R680	ERD25FJ681	680Ω 1/4W	1
R681	ERD25FJ152	1.5kΩ 1/4W	1
R682, 683	ERD25TJ393	39kΩ 1/4W	2
R684	ERD25FJ471	470Ω 1/4W	1
R685	ERD25TJ123	12kΩ 1/4W	1
R686	ERQ12HJ150	15Ω 1/2W	1
R687	ERD25FJ392	3.9kΩ 1/4W	1
R688	ERD25TJ123	12kΩ 1/4W	1
R689, 690	ERD25TJ473	47kΩ 1/4W	2
R691, 692	ERD25FJ392	3.9kΩ 1/4W	2
R693, 694	ERD25TJ393	39kΩ 1/4W	2
R695, 696	ERD25FJ560	56Ω 1/4W	2
R697, 698	ERD25FJ471	470Ω 1/4W	2
R699	ERD25TJ123	12kΩ 1/4W	1

Ref. No.	Part No.	Description	Per Set (pcs.)
CAPACITORS			
C640	ECCD1H331J	330 PF 50V	1
C641	ECEA1HS100	10μF 50V	1
C642	ECEA50Z2R2	2.2μF 50V	1
C643	ECEA1ES470	47μF 25V	1
C644	ECEA1CS330	33μF 16V	1
C645	ECEA1HS100	10μF 50V	1
C646	ECEA16N3R3	3.3μF 16V	1
C647	ECEA50Z2R2	2.2μF 50V	1
C648	ECKD1H102KB	0.001μF 50V	1
C649	ECKD1H332KB	0.0033μF 50V	1
C650	ECEA1HS100	10μF 50V	1
C651	ECEA1HS100	10μF 50V	1

REPLACEMENT PARTS LIST

NOTE:
1. Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
2. Parts No. listed in this Parts List are of Service Parts.

Ref. No.	Part No.	Description	Per Set (pcs.)
TRSANSISTORS			
Q001, 002	2SC945L	LPF	2
Q003, 004	2SC945L	LPF	2
Q005, 006	2SC945L	Switching	2
Q007, 008	2SC945L	Switching	2
Q009, 010	2SC945L	Switching	2
Q011	2SA564	Switching	1
Q012, 013	2SC945L	Multivibrator	2
Q014, 015	2SC945L	Switching	2
Q016, 017	2SC945L	Switching	2
Q018	2SC1675-L	FM Buffer	1
Q019	2SC945L	Switching	1
Q020	2SA733-P1	Flip-Flop	1
Q021	2SC945L	Switching	1
Q101, 102	2SC2000	AM Conv	2
Q103	2SC2000	AM Buffer AMP	1
Q104, 105	2SC945L	Switching	2
Q106	2SC945L	Switching	1
Q107	2SA564	Switching	1
Q108, 109	2SA733-P1	Switching	2
Q201	2SC945L	AM Amp	1
Q202	2SC1844	FM Amp	1
Q203	2SC945L	Switching	1
Q204, 205	2SA564	Switching, Muting	2
Q206	2SC828AR	Muting	1
Q401, 402	2SC1328-T	EQ/Mic Amp	2
Q403, 404	2SC1328-T	EQ/Mic Amp	2
Q405, 406	2SC1685-Q	REC Amp	2
Q501, 502	2SC1685-Q	Muting	2
Q503	2SA564	Muting	1
Q601, 602	2SC1328-T	PH EQ Amp	2
Q603, 604	2SC1328-T	PH EQ Amp	2
Q701, 702	2SA798AFG-2	Differential Amp	2
Q703, 704	2SC828AR	Current Mirror	2
Q705, 706	2SC1844	Pre Drive	2
Q801	2SC1383NC	Bias OSC	1
Q802, 803	2SC828AR	Switching, Muting	2
Q804	2SC828AR	Muting	1
Q805, 806	2SC945L	Muting	2
Q901	2SC945L	Muting	1
Q902	2SD837LS	Stabilizer	1
INTEGRATED CIRCUIT			
IC001	TD6102P	Pre Scaler	1
IC002	TC9125P	PLL	1
IC003	TC9129P	Controller	1
IC004	TC4511BP	Decorder	1

Ref. No.	Part No.	Description	Per Set (pcs.)
IC005, 006	TC5064BP	Driver	2
IC201	AN217P	AM/FM IF Amp	1
IC202	UPC1167C	FM IF Det	1
IC301	LA3350S	FM MPX	1
IC501	AN6552F	AF Amp	1
IC701 ⚠	STK2029K	Power Amp	1
IC801, 802	NE646BN	Dolby Amp	2
IC803, 804	BA682A	LED Driver	2
DIODES			
D01, 02	2OA90	FM AGC	2
D001, 002	MA162A	Switching	2
D003, 004	MA162A	Switching	2
D005	MA162A	Switching	1
D006	MA162A	Switching	1
D007, 008	MA162A	Switching	2
D009	MA162A	AM IF Offset	1
D011	MA162A	Switching	1
D012	MA1091	Stabilizer	1
D013	MA162A	Switching	1
D015, 016	MA162A	Switching	2
D017	MA162A	Switching	1
D018	LN21RCPHL	Memory Ind	1
D019, 020	MA162A	Switching	2
D101, 102	1SS91-G	Switching	2
D103	1SV100MW	AM Varactor	1
D104	1SV100LW	AM Varactor	1
D105	1SV100MW	AM Varactor	1
D106	1SV100LW	AM Varactor	1
D107, 108	MA162A	Switching	2
D110, 111	SLP256B	Band Ind	2
D112	SLP256B	Band Ind	1
D201	MA162A	Switching	1
D202, 203	2OA90	Switching, AM AGC	2
D204, 205	2OA90	AM Det	2
D206	MA27A2	AM AOC	1
D207, 209	MA162A	Switching	2
D210	SLP256B	Tuning Ind	1
D211, 212	MA162A	Switching	2
D301	MA162A	Switching	1
D303	SLP156B	Stereo Ind	1
D304	MA162A	Switching	1
D640	LN217RP	Size Sensor	1
D641	LN317GP	Size Sensor	1
D642, 643	LN217RP	Size Sensor	2
D701, 702	MA27A2	AOC	2
D703	MA1130	Stabilizer	1
D803	MA162A	Switching	1
D808	LN24144	VU Meter	1
D809	LN224RP	REC Ind	1
D810	LN317GP	Dolby Ind	1
D901, 902 ⚠	S2V20F	Rect	2
D903, 904 ⚠	S2V20F	Rect	2

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
D905	MA162A	Rect	1
D906	MA162A	Switching	1
D907	MA1160	Stabilizer	1
D908, 909 ⚠	RD7.5FB	Stabilizer	2
D910 ⚠	RD6.2FB	Stabilizer	1
D911	LN271RP	Power Ind	1
D912 ⚠	S5VB20F4	Rect	1
FLUORESCENT DISPLAY			
FL001	RAD5BT11	Display	1
THERMISTER			
TH801	ERTD2FHK202S	Thermister	1
FUSES			
F901, 902 ⚠	XBA2C20TR0	Fuse 250V T2A	2
F903, 904 ⚠	XBA2C50TR0	Fuse 250V T5A	2
TUNER			
	ENF3JE02	FM Tuner	1
COILS AND TRANSFORMERS			
L1, 2	SLF6E4-0	Ant. Coil	1
L001	SLQY25S-20	Choke Coil	1
L002	SLQZ101-2D	Trap Coil	1
L003	RLQY15G5-0	RFC Coil	1
L004	RLI2M402-M	Scan	1
L101	RLQY30S1-0	RFC Coil	1
L102	SL02M6-M	OSC Coil, MW	1
L103	SL01M8-M	OSC Coil, LW	1
L201	SLQZ101-2D	Trap Coil	1
L301, 302	SLM9Z12-M	MPX Filter	2
L405, 406	SLQU222-2Y	Rec. EQ Coil	2
L407, 408	SLQV393-4M	Bias Trap Coil	2
L701, 702	SLQY80S-20	Sp. Coil	2
L801	SL09Z38-K	Bias OSC Coil	1
L802	SLQU270-2K	RFC Coil	1
L803, 804	SLQV393-4M	Bias Trap Coil	2
L805	SLQU270-2K	RFC Coil	1
T1 ⚠	SLT5Z16-W	Power Trans.	1
T2	SLAA4W1-3	Balun	1
T001	SLT5E4-V	Converter Trans.	1
T201	SLI4C512-K	Disc Coil, FM	1
T202	SLI4C514-K	Disc Coil, FM	1
T203	SLI2M102-M	1st IFT, AM	1
T204	SLI7W106-M	CFT, AM	1
T205	RLI2M402-M	3rd IFT, AM	1
CF201, 202	SVF107MA53A	Ceramic Filter, FM	2
CF203	SVF107MA53A	Ceramic Filter, FM	1

Ref. No.	Part No.	Discription		Per Set (pcs.)
COMPONENT CONBINATIONS				
Z001	EXBP86104K	R-R		1
Z002	EXBP87104K	R-R		1
Z201	EXF3SL04C	C-C		1
Z202	EXAF203Z471	C-R		1
Z203	EXF3SL04C	C-C		1
Z701, 702	EXRP331K333T	C-R		2
Z901, 902	RXAF103Z22E	C-C		2
Z903, 904	RXAF103Z22E	C-C		2
VARIABLE RESISTORS				
VR201	EVTS3MA00B24	Preset	20kΩ B	1
VR301	EVTS3MA00B13	Preset	1kΩ B	1
VR302	EVTS6AA00B53	Preset	5kΩ B	1
VR401, 402	EVTS3MA00B24	Preset	20k ΩB	2
VR403, 404	EVTS3MA00B53	Preset	5kΩ B	2
VR405, 406	EWKANAF27B54	Rec. Volume	50kΩ B	1
VR501, 502	EWKG7A063A54	Volume	50kΩ A	1
VR503	EVHFDA528G54	Balance	50kΩ G	1
VR504, 505	EWKEUAD63C15	Tone	100kΩ C	1
VR506, 507	EWKEUAD63C15	Tone	100kΩ C	1
VR801	EVTS6AA00B24	Preset	20kΩ B	1
VR802	EVTS3MA00B14	Preset	10kΩ B	1
VR803	EVTS3MA00B53	Preset	5kΩ B	1
VR805, 806	EVTS3MA00B52	Preset	500Ω B	2
VR807, 808	EVTS3MA00B54	Preset	50kΩ B	2
VARIABLE CAPACITORS				
CT101, 102	ECV1ZW10X53N	Trimmer		2
CT103, 104	SCVCTY211D31	Trimmer		1
SWITCHES				
S001 ～010	SSP58	Tact		10
S011, 012	SSP54	Tact		2
S013 ～017	SSP58	Tact		5
S1 ⚠	ESB70294	Power		1
S2 ⚠	ESE37205	Voltage Selector		1
S3	SSS104	WDS		1
S601 ～605	SSP54	Player Switch		5
S701-1 ～2	SSH120	Speaker Selector		1
S802	SSR160	Tape Selector		1
ST1 ～14	ESD81575	Rec. Switch		1
SF	SSH716	Function		1
CRYSTAL				
X001	EYXBE905S12T	Crystal		1

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
PACKING			
PA1	SPN4436	Corton Box	1
PA2	SPN4438	Pad A	1
PA3	SPN4440	PH Spacer	1
PA4	SPN4442	Pad, PH	1
PA5	SPN4444	T.T. Sheet	1
PA6	SPN4446	PU Holder	1
PA7	SPN4458	Pad B	1
PA8	XZB75X67C05S	Poly Cover	1
PA9	SNE260S	PH Mounting Screw	2
MA10	SNW601	Felt Washer	4
OTHERS			
1	SQX50320	Instruction Book	1

Numbering System of Resistor

Type	Wattage	Tolerance	Value
Three Letters	One or Two Letters	Two or Three Letters	Three or Four Letters

Example: E R D 2 5 — T J — 1 0 1

Resistor Type	Tolerance
ERD: Carbon Film ERC: Solid ERX: Metal Film ERG: Metal Oxide Film ERO: High Stability Metal Film ERF: Flameproof Wire-Wound Bath-Tube ERQ: Fuse Type Metal Film	F: ±1% J: ±5% K: ±10%

Ref. No.	Part No.	Description		Per Set (pcs.)
RESISTORS				
R001	ERD25FJ330	33Ω	1/4W	1
R002	ERD25FJ103	10kΩ	1/4W	1
R003	ERD25FJ102	1kΩ	1/4W	1
R004	ERD25FJ222	2.2kΩ	1/4W	1
R005	ERD25FJ102	1kΩ	1/4W	1
R006	ERD25FJ103	10kΩ	1/4W	1
R007	ERD25FJ222	2.2kΩ	1/4W	1
R008, 009	ERD25FJ103	10kΩ	1/4W	2
R011	ERD25FJ101	100Ω	1/4W	1
R012	ERD25FJ103	10kΩ	1/4W	1
R013, 014	ERD25FJ222	2.2kΩ	1/4W	2
R015	ERD25FJ222	2.2kΩ	1/4W	1
R016	ERD25FJ102	1kΩ	1/4W	1
R017	ERD25TJ273	27kΩ	1/4W	1
R018	ERD25TJ104	100kΩ	1/4W	1
R019	ERD25TJ183	18kΩ	1/4W	1
R020	ERD25TJ334	330kΩ	1/4W	1
R021	ERD25FJ103	10kΩ	1/4W	1
R022, 023	ERD25TJ104	100kΩ	1/4W	2
R024	ERD25TJ104	100kΩ	1/4W	1
R025	ERD25TJ105	1 MΩ	1/4W	1
R026, 027	ERD25FJ103	10kΩ	1/4W	2
R029	ERD25FJ103	10kΩ	1/4W	1
R030	ERD25FJ102	1kΩ	1/4W	1
R031	ERD25TJ104	100kΩ	1/4W	1
R032	ERD25TJ104	100kΩ	1/4W	1
R033	ERD25FJ102	1kΩ	1/4W	1
R034	ERD25FJ103	10kΩ	1/4W	1
R035	ERD25FJ682	6.8kΩ	1/4W	1
R037	ERD25FJ222	2.2kΩ	1/4W	1
R040, 041	ERD25TJ473	47kΩ	1/4W	2
R042	ERD25TJ473	47kΩ	1/4W	1
R043	ERD25FJ682	6.8kΩ	1/4W	1

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Discription	Per Set (pcs.)
R044	ERD25FJ220	22Ω 1/4W	1
R045	ERD25FJ102	1kΩ 1/4W	1
R046	ERD25TJ223	22kΩ 1/4W	1
R047	ERD25FJ103	10kΩ 1/4W	1
R048	ERD25FJ101	100Ω 1/4W	1
R049	ERD25FJ221	220Ω 1/4W	1
R050	ERD25TJ223	22kΩ 1/4W	1
R051	ERD25FJ102	1kΩ 1/4W	1
R052	ERD25FJ103	10kΩ 1/4W	1
R053	ERD25FJ332	3.3kΩ 1/4W	1
R054	ERD25FJ331	330Ω 1/4W	1
R055	ERD25TJ224	220kΩ 1/4W	1
R056, 057	ERD25TJ474	470kΩ 1/4W	2
R058	ERD25TJ474	470kΩ 1/4W	1
R059	ERD25TJ104	100kΩ 1/4W	1
R060	ERD25TJ104	100kΩ 1/4W	1
R101, 102	ERD25TJ104	100kΩ 1/4W	2
R103, 104	ERD25TJ333	33kΩ 1/4W	2
R105, 106	ERD25FJ103	10kΩ 1/4W	2
R107	ERD25FJ152	1.5kΩ 1/4W	1
R108	ERD25FJ272	2.7kΩ 1/4W	1
R109	ERD25FJ100	10Ω 1/4W	1
R110	ERD25FJ330	33Ω 1/4W	1
R111, 112	ERD25TJ104	100kΩ 1/4W	2
R113, 114	ERD25TJ223	22kΩ 1/4W	2
R115	ERD25TJ104	100kΩ 1/4W	1
R117, 118	ERD25FJ332	3.3kΩ 1/4W	2
R119, 120	ERD25FJ103	10kΩ 1/4W	2
R121, 122	ERD25FJ682	6.8kΩ 1/4W	2
R123	ERD25FJ103	10kΩ 1/4W	1
R124	ERD25FJ682	6.8kΩ 1/4W	1
R125, 126	ERD25FJ681	680Ω 1/4W	2
R127	ERD25FJ681	680Ω 1/4W	1
R128	ERD25TJ155	1.5 MΩ 1/4W	1
R129	ERD25FJ103	10kΩ 1/4W	1
R130	ERD25FJ102	1kΩ 1/4W	1
R201	ERD25FJ471	470Ω 1/4W	1
R202, 203	ERD25FJ331	330Ω 1/4W	2
R204	ERD25FJ331	330Ω 1/4W	1
R205	ERD25FJ102	1kΩ 1/4W	1
R206	ERD25FJ882	8.8kΩ 1/4W	1
R207	ERD25FJ103	10kΩ 1/4W	1
R208	ERD25FJ331	330Ω 1/4W	1
R209	ERD25FJ103	10kΩ 1/4W	1
R210	ERD25FJ331	330Ω 1/4W	1
R211	ERD25FJ562	5.6kΩ 1/4W	1
R212	ERD25FJ182	1.8kΩ 1/4W	1
R213	ERD25FJ682	6.8kΩ 1/4W	1
R214	ERD25FJ222	2.2kΩ 1/4W	1
R215	ERD25TJ224	220kΩ 1/4W	1
R216	ERD25TJ333	33kΩ 1/4W	1
R217 ⚠	ERQ12HJ470	47Ω 1/2W	1
R218	ERD25TJ473	47kΩ 1/4W	1

Ref. No.	Part No.	Description	Per Set (pcs.)
R222	ERD25FJ470	47Ω 1/4W	1
R223	ERD25TJ104	100kΩ 1/4W	1
R224	ERD25FJ471	470Ω 1/4W	1
R225	ERD25TJ153	15kΩ 1/4W	1
R226	ERD25FJ102	1kΩ 1/4W	1
R227	ERD25FJ152	1.5kΩ 1/4W	1
R228	ERD25FJ332	3.3kΩ 1/4W	1
R229	ERD25TJ224	220kΩ 1/4W	1
R230	ERD25FJ272	2.7kΩ 1/4W	1
R231	ERD25FJ103	10kΩ 1/4W	1
R232, 233	ERD25TJ333	33kΩ 1/4W	2
R234, 235	ERD25FJ103	10kΩ 1/4W	2
R236	ERD25TJ475	4.7 MΩ 1/4W	1
R237	ERD25FJ392	3.9kΩ 1/4W	1
R238	ERD25FJ562	5.6kΩ 1/4W	1
R239	ERD25FJ103	10kΩ 1/4W	1
R240	ERD25TJ104	100kΩ 1/4W	1
R241	ERD25TJ223	22kΩ 1/4W	1
R242	ERD25TJ155	1.5 MΩ 1/4W	1
R243	ERD25FJ681	680Ω 1/4W	1
R245	ERD25TJ224	220kΩ 1/4W	1
R246	ERD25TJ333	33kΩ 1/4W	1
R247	ERD25FJ472	4.7kΩ 1/4W	1
R301	ERD25FJ103	10kΩ 1/4W	1
R302	ERD25FJ152	1.5kΩ 1/4W	1
R303, 304	ERD25FJ272	2.7kΩ 1/4W	2
R305, 306	ERD25FJ472	4.7kΩ 1/4W	2
R307, 308	ERD25FJ103	10kΩ 1/4W	2
R309	ERD25FJ102	1kΩ 1/4W	1
R310	ERD25FJ103	10kΩ 1/4W	1
R311	ERD25TJ273	27kΩ 1/4W	1
R312	ERD25FJ332	3.3kΩ 1/4W	1
R313	ERD25FJ682	6.8kΩ 1/4W	1
R314	ERD25FJ332	3.3kΩ 1/4W	1
R315, 316	ERD25TJ274	270kΩ 1/4W	2
R317	ERD25FJ103	10kΩ 1/4W	1
R401, 402	ERD25FJ100	10Ω 1/4W	2
R403, 404	ERD25TJ104	100kΩ 1/4W	2
R405, 406	ERD25FJ101	100Ω 1/4W	2
R407, 408	ERD25TJ104	100kΩ 1/4W	2
R409, 410	ERD25TJ154	150kΩ 1/4W	2
R411, 412	ERD25FJ102	1kΩ 1/4W	2
R413, 414	ERD25FJ103	10kΩ 1/4W	2
R415, 416	ERD25TJ123	12kΩ 1/4W	2
R417, 418	ERD25TJ154	150kΩ 1/4W	2
R419, 420	ERD25FJ822	8.2kΩ 1/4W	2
R421, 422	ERD25FJ392	3.9kΩ 1/4W	2
R423	ERD25TJ393	39kΩ 1/4W	1
R425, 426	ERD25FJ221	220Ω 1/4W	2
R427, 428	ERD25FJ332	3.3kΩ 1/4W	2
R429, 430	ERD25TJ334	330kΩ 1/4W	2
R431, 432	ERD25FJ102	1kΩ 1/4W	2
R433, 434	ERD25FJ471	470Ω 1/4W	2

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
R435, 436	ERD25FJ330	33Ω 1/4W	2
R437, 438	ERD25FJ152	1.5kΩ 1/4W	2
R439, 440	ERD25FJ331	330Ω 1/4W	2
R441, 442	ERD25FJ561	560Ω 1/4W	2
R443, 444	ERD25FJ471	470Ω 1/4W	2
R445, 446	ERD25FJ102	1kΩ 1/4W	2
R447, 448	ERD25FJ103	10kΩ 1/4W	2
R449, 450	ERD25TJ333	33kΩ 1/4W	2
R451, 452	ERD25FJ332	3.3kΩ 1/4W	2
R453, 454	ERD25FJ102	1kΩ 1/4W	2
R501, 502	ERD25TJ333	33kΩ 1/4W	2
R503, 504	ERD25TJ153	15kΩ 1/4W	2
R505, 506	ERD25FJ222	2.2kΩ 1/4W	2
R507, 508	ERD25TJ473	47kΩ 1/4W	2
R509, 510	ERD25TJ153	15kΩ 1/4W	2
R511, 512	ERD25TJ473	47kΩ 1/4W	2
R513	ERD25TJ104	100kΩ 1/4W	1
R514	ERD25TJ153	15kΩ 1/4W	1
R515, 516	ERD25FJ152	1.5kΩ 1/4W	2
R517, 518	ERD25TJ153	15kΩ 1/4W	2
R519, 520	ERD25TJ183	18kΩ 1/4W	2
R521, 522	ERD25FJ222	2.2kΩ 1/4W	2
R550	ERD25FJ102	1kΩ 1/4W	1
R551 ⚠	ERQ12HJ101	100Ω 1/2W	1
R552	ERD25TJ473	47kΩ 1/4W	1
R601, 602	ERD25FJ102	1kΩ 1/4W	2
R603, 604	ERD25FJ561	560Ω 1/4W	2
R605, 606	ERD25TJ154	150kΩ 1/4W	2
R607, 608	ERD25TJ154	150kΩ 1/4W	2
R609, 610	ERD25FJ821	820Ω 1/4W	2
R611, 612	ERD25TJ154	150kΩ 1/4W	2
R613, 614	ERD25FJ682	6.8kΩ 1/4W	2
R615, 616	ERD25FJ472	4.7kΩ 1/4W	2
R617	ERD25FJ102	1kΩ 1/4W	1
R618	ERD25FJ103	10kΩ 1/4W	1
R619, 620	ERD25TJ104	100kΩ 1/4W	2
R621, 622	ERD25TJ104	100kΩ 1/4W	2
R701, 702	ERD25FJ103	10kΩ 1/4W	2
R705, 706	ERD25FJ332	3.3kΩ 1/4W	2
R707, 708	ERD25TJ153	15kΩ 1/4W	2
R709, 710	ERD25FJ151	150Ω 1/4W	2
R711, 712	ERD25FJ471	470Ω 1/4W	2
R713, 714	ERD25FJ152	1.5kΩ 1/4W	2
R715, 716	ERD25TJ153	15kΩ 1/4W	2
R717, 718	ERD25TJ223	22kΩ 1/4W	2
R719, 720	ERD25FJ100	10Ω 1/4W	2
R721, 722	ERD25TJ153	15kΩ 1/4W	2
R723, 724	ERD25FJ682	6.8kΩ 1/4W	2
R725, 726	ERD25FJ182	1.8kΩ 1/4W	2
R727, 728	ERD25FJ882	8.8kΩ 1/4W	2
R729, 730	ERD25FJ102	1kΩ 1/4W	2
R731, 732	ERD25FJ222	2.2kΩ 1/4W	2
R733, 734	ERD25FJ472	4.7kΩ 1/4W	2

Ref. No.	Part No.	Description	Per Set (pcs.)
R735, 736	ERD25FJ332	3.3kΩ 1/4W	2
R737, 738 ⚠	ERG1ANJP331S	330Ω 1W	2
R739, 740	ERD25FJ392	3.9kΩ 1/4W	2
R741, 742 ⚠	ERQ12HJ101	100Ω 1/2W	2
R743	ERD25FJ122	1.2kΩ 1/4W	1
R744, 745	ERD25FJ100	10Ω 1/4W	2
R746, 747 ⚠	ERG1ANJP331S	330Ω 1W	2
R801, 802	ERD25FJ102	1kΩ 1/4W	2
R803, 804	ERD25FJ332	3.3kΩ 1/4W	2
R805, 806	ERD25FJ181	180Ω 1/4W	2
R807, 808	ERD25TJ105	1 MΩ 1/4W	2
R809, 810	ERD25TJ473	47kΩ 1/4W	2
R811, 812	ERD25TJ184	180kΩ 1/4W	2
R813, 814	ERD25TJ274	270kΩ 1/4W	2
R815, 816	ERD25FJ102	1kΩ 1/4W	2
R817, 818	ERD25FJ102	1kΩ 1/4W	2
R819, 820	ERD25TJ333	33kΩ 1/4W	2
R821, 822	ERD25FJ332	3.3kΩ 1/4W	2
R823, 824	ERD25FJ102	1kΩ 1/4W	2
R825, 826	ERD25FJ682	6.8kΩ 1/4W	2
R827	ERD25TJ474	470kΩ 1/4W	1
R828	ERD25FJ152	1.5kΩ 1/4W	1
R829, 830	ERD25FJ103	10kΩ 1/4W	2
R831, 832	ERD25FJ331	330Ω 1/4W	2
R833	ERD25FJ152	1.5kΩ 1/4W	1
R834	ERD25FJ222	2.2kΩ 1/4W	1
R835	ERD25FJ152	1.5kΩ 1/4W	1
R836	ERD25FJ222	2.2kΩ 1/4W	1
R837	ERD25TJ153	15kΩ 1/4W	1
R838	ERD25FJ4R7	4.7Ω 1/4W	1
R839	ERD25TJ104	100kΩ 1/4W	1
R840	ERD25FJ1R0	1Ω 1/4W	1
R841 ⚠	ERG1ANJP121S	120Ω 1W	1
R842 ⚠	ERG1ANJP181S	180Ω 1W	1
R861, 862	ERD25TJ334	330kΩ 1/4W	2
R863, 864	ERD25TJ473	47kΩ 1/4W	2
R865, 866	ERD25FJ103	10kΩ 1/4W	2
R867, 868	ERD25FJ103	10kΩ 1/4W	2
R869, 870	ERD25FJ271	270Ω 1/4W	2
R871, 872	ERD25FJ271	270Ω 1/4W	2
R873, 874	ERD25FJ271	270Ω 1/4W	2
R875	ERD25FJ102	1kΩ 1/4W	1
R901	ERD25TJ823	82kΩ 1/4W	1
R902	ERD25FJ472	4.7kΩ 1/4W	1
R903, 904	ERD25FJ103	10kΩ 1/4W	2
R905	ERD25FJ152	1.5kΩ 1/4W	1
R906	ERD25FJ221	220Ω 1/4W	1
R907 ⚠	ERQ3CJ181	180Ω 3W	1
R908 ⚠	ERQ12HJ100	10Ω 1/2W	1
R909 ⚠	ERQ2CJ820	82Ω 2W	1
R910 ⚠	ERQ12HJ470	47Ω 1/2W	1
R911 ⚠	ERQ12HJ100	10Ω 1/2W	1
R912 ⚠	ERQ12HJ470	47Ω 1/2W	1

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
R913	ERD25FJ102	1kΩ 1/4W	1
R914	ERD25FJ331	330Ω 1/4W	1
R915 ⚠	ERQ12HJ220	22Ω 1/2W	1
R916	ERD25FJ222	2.2kΩ 1/4W	1
R917	ERD25FJ152	1.5kΩ 1/4W	1
R918	ERD25FJ222	2.2kΩ 1/4W	1

Numbering System of Capacitor

Type	Voltage	Value	Tolerance
Four Letters	One or Two Letters	Two to Five Letters	One or Two Letters

Example: E C K D 1 H 3 3 3 M D

Capacitor Type	Tolerance
ECCD: Temperature Compensating Ceramic ECKD: High Dielectric Constant Ceramic ECQM: Polyester ECQS: Polystyrene Film ECFD: Semiconductor Ceramic ECEA: Electrolytic ECEB: Electrolytic ECET: Electrolytic ECSF: Tantalum	C: ±0.25pF D: ±0.5pF F: ±1pF J: ±5% K: ±10% M: ±20% P: +100, −0% Z: +80, −20%

Ref. No.	Part No.	Description	Per Set (pcs.)
CAPACITORS			
C1	ECCD1H151K	150 PF 50V	1
C2	ECCD1H331K	330 PF 50V	1
C01	ECCD1H101K	100 PF 50V	1
C02	ECFD1H332KD	0.0033μF 50V	1
C001	ECKD1H103ZF	0.01μF 50V	1
C002	ECCD1H101K	100 PF 50V	1
C003, 004	ECFD1E103MD	0.01μF 25V	2
C005	ECFD1E223MD	0.022μF 25V	1
C006	ECEA1HN2R2SE	2.2μF 50V	1
C007	ECFD1E103MD	0.01μF 25V	1
C008	ECEA1HNR47SE	0.47μF 50V	1
C009	ECFD1E103MD	0.01μF 25V	1
C010	ECEA50Z1	1μF 50V	1
C011, 012	ECKD1H103ZF	0.01μF 50V	2
C013	ECKD1H103ZF	0.01μF 50V	1
C014	ECCD1H680KC	68 PF 50V	1
C015	ECCD1H470KC	47 PF 50V	1
C016	ECEA50MR47R	0.47μF 50V	1
C017	ECEA50Z1	1μF 50V	1
C018, 019	ECKD1H221KB	220 PF 50V	2
C020	ECFD1E333MD	0.033μF 25V	1
C021	ECFD1E223MD	0.022μF 25V	1
C022	ECEA50Z1	1μF 50V	1
C023	ECEA1ES470	47μF 25V	1
C025	ECEA50Z1	1μF 50V	1
C026	ECEA1AS471	470μF 10V	1
C027	ECKD1H223ZF	0.022μF 50V	1
C028	ECEA1AS471	470μF 10V	1
C029	ECEA1AS221	220μF 10V	1
C031, 032	ECKD1H103ZF	0.01μF 50V	2
C033	ECEA1AS221	220μF 10V	1
C034	ECEA1HS100	10μF 50V	1
C035	ECQS1821JZ	820 PF 125V	1
C036	ECFD1E333MD	0.033μF 25V	1

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
C037	ECEA1HS100	10μF 50V	1
C038	ECKD1H102KB	0.001μF 50V	1
C039, 040	ECKD1H103ZF	0.01μF 50V	2
C041	ECKD1H103ZF	0.01μF 50V	1
C042	ECKD1H223ZF	0.022μF 50V	1
C043, 044	ECKD1H223ZF	0.022μF 50V	2
C045, 046	ECKD1H223ZF	0.022μF 50V	2
C047	ECKD1H103ZF	0.01μF 50V	1
C102	ECFD1E473MD	0.047μF 25V	1
C104	ECCD1H220K	22 PF 50V	1
C105, 106	ECFD1E223MD	0.022μF 25V	2
C107	ECFD1E103MD	0.01μF 25V	1
C108	ECFD1E333MD	0.033μF 25V	1
C109, 110	ECKD1H223ZF	0.022μF 50V	2
C111	ECFD1E103MD	0.01μF 25V	1
C112	ECFD1E223MD	0.022μF 25V	1
C113	ECCD1H100F	10 PF 50V	1
C115, 116	ECFD1E223MD	0.022μF 25V	2
C117	ECCD1H030C	3 PF 50V	1
C118	ECCD1H070D	7 PF 50V	1
C119	ECFD1E103MD	0.01μF 25V	1
C120	ECCD1H820J	82 PF 50V	1
C121	ECKD1H223ZF	0.022μF 50V	1
C122	ECEA1ES470	47μF 25V	1
C123	ECQS1471JZ	470 PF 125V	1
C124	ECQS1221JZ	220 PF 125V	1
C125	ECEA50MR22R	0.22μF 50V	1
C126	ECEA1ES101	100μF 25V	1
C201, 202	ECFD1E223MD	0.022μF 25V	2
C203	ECKD1H103ZF	0.01μF 50V	1
C204	ECEA25Z4R7	4.7μF 25V	1
C205	ECEA50Z1	1μF 50V	1
C206	ECCD1H680K	68 PF 50V	1
C207	ECEA50Z1	1μF 50V	1
C208	ECCD1H080D	8 PF 50V	1
C209	ECKD1H151KB	150 PF 50V	1
C210	ECEA1HN010SE	1μF 50V	1
C211	ECKD1H223ZF	0.022μF 50V	1
C212	ECFD1E223MD	0.022μF 25V	1
C213	ECKD1H103ZF	0.01μF 50V	1
C214	ECEA1ES470	47μF 25V	1
C215, 216	ECKD1H103ZF	0.01μF 50V	2
C217, 218	ECKD1H103ZF	0.01μF 50V	2
C219	ECEA50Z1	1μF 50V	1
C220	ECQS1152JZ	1500 PF 125V	1
C221	ECKD1H103ZF	0.01μF 50V	1
C222	ECEA1HS100	10μF 50V	1
C223	ECCD1H470K	47 PF 50V	1
C224	ECEA50Z3R3	3.3μF 50V	1
C225	ECEA1HS100	10μF 50V	1
C226	ECFD1E473MD	0.047μF 25V	1
C228	ECEA25Z4R7	4.7μF 25V	1
C229	ECEA1HN010SE	1μF 50V	1

Ref. No.	Part No.	Description	Per Set (pcs.)
C230	ECEA1AS221	220μF 10V	1
C231, 232	ECEA1CS221	220μF 16V	2
C233, 234	ECEA1E223MD	0.022μF 25V	2
C301	ECEA25Z4R7	4.7μF 25V	1
C302	ECEA1ES470	47 PF 25V	1
C303, 304	ECEA50MR1R	0.1μF 50V	2
C305, 306	ECQM1H223KZ	0.022μF 50V	2
C307	ECEA50Z1	0.1μF 50V	1
C308	ECEA50MR47R	0.47μF 50V	1
C309	ECEA50MR22R	0.22μF 50V	1
C310	ECQS1152JZ	1500 PF 125V	1
C311	ECQM1H473KZ	0.047μF 50V	1
C313, 314	ECKD1H821KB	820 PF 50V	2
C401, 402	ECKD1H681KB	680 PF 50V	2
C403, 404	ECFD1E103MD	0.01μF 25V	2
C405, 406	ECEA50M4R7R	4.7μF 50V	2
C407, 408	ECFD1H102KD	0.001μF 50V	2
C409, 410	ECEA1HS100	10μF 50V	2
C411, 412	ECEA1HS100	10μF 50V	2
C413, 414	ECQM1H153KZ	0.015μF 50V	2
C415, 416	ECFD1H682KD	0.0068μF 50V	2
C417	ECEA1AS221	220μF 10V	1
C419, 420	ECQM1H682KZ	0.0068μF 50V	2
C421, 422	ECEA50MR68R	0.68μF 50V	2
C423, 424	ECEA50Z1	1μF 50V	2
C425, 426	ECCD1H470K	47 PF 50V	2
C427, 428	ECEA1HS100	10μF 50V	2
C429, 430	ECEA1HS100	10μF 50V	2
C431	ECQM1H563KS	0.056μF 50V	1
C432	ECQM1H563KZ	0.056μF 50V	1
C433, 434	ECQM1H393KZ	0.039μF 50V	2
C435, 436	ECEA50MR1R	0.1μF 50V	2
C437, 438	ECEA50MR15R	0.15μF 50V	2
C439, 440	ECEA50MR1R	0.1μF 50V	2
C441, 442	ECQM1H472KZ	0.0047μF 50V	2
C443, 444	ECKD1H561KB	560 PF 50V	2
C445, 446	ECKD1H221KB	220 PF 50V	2
C447	ECKD1H223ZF	0.022μF 50V	1
C501, 502	ECEA50Z1	1μF 50V	2
C503, 504	ECEA50Z1	1μF 50V	2
C505, 506	ECKD1H221KB	220 PF 50V	2
C507, 508	ECEA50MR1R	0.1μF 50V	2
C509, 510	ECEA1HS100	10μF 50V	2
C511, 512	ECKD1H100F	10 PF 50V	2
C513	ECEA1ES221	220μF 25V	1
C515, 516	ECKD1H151KB	150 PF 50V	2
C517	ECEA50Z1	1μF 50V	1
C601, 602	ECEA50M1R	1μF 50V	2
C603, 604	ECKD1H102KB	0.001μF 50V	2
C605, 606	ECQM1H393KZ	0.039μF 50V	2
C607, 608	ECQM1H123KZ	0.012μF 50V	2
C609, 610	ECEA50Z1	1μF 50V	2
C611	ECEA1ES470	47μF 25V	1

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Per Set (pcs.)
C612	ECEA1ES101	100μF 25V	1
C613	ECEA1CS471	470μF 16V	1
C615, 616	ECCD1H470K	47 PF 50V	2
C701, 702	ECEA50M2R2R	2.2μF 50V	2
C705, 706	ECKD1H471KB	470 PF 50V	2
C707, 708	ECKD1H331KB	330 PF 50V	2
C709, 710	ECCD1H050D	5 PF 50V	2
C711, 712	ECEA1AS470	47μF 10V	2
C713, 714	ECEA1VS330	33μF 35V	2
C715, 716	ECCD1H330K	33 PF 50V	2
C717, 718	ECQM1H224MZ	0.22μF 50V	2
C719, 720	ECQM1H333KZ	0.033μF 50V	2
C721, 722	ECQM1H103KZ	0.01μF 50V	2
C723, 724	ECQM1H102KZ	0.001μF 50V	2
C725, 726	ECEA1HS470	47μF 50V	2
C727, 728	ECCD1H101K	100 PF 50V	2
C729, 730	ECCD1H101K	100 PF 50V	2
C731, 732	ECQM1H104MZ	0.1μF 50V	2
C733, 734	ECQM1H104MZ	0.1μF 50V	2
C735	ECEA1VS101	100μF 35V	1
C736	ECEA1HS100	10μF 50V	1
C737	ECEA1HS221	220μF 50V	1
C801, 802	ECEA50MR68R	0.68μF 50V	2
C803, 804	ECEA1HS100	10μF 50V	2
C805, 806	ECKD1H271KB	270 PF 50V	2
C807, 808	ECFD1H222KD	0.0022μF 50V	2
C809, 810	ECEA1HS100	10μF 50V	2
C811, 812	ECQS1562JZ	5600 PF 125V	2
C813, 814	ECQS1472JZ	4700 PF 125V	2
C815, 816	ECQM1H273JZ	0.027μF 50V	2
C817, 818	ECEA1HS100	10μF 50V	2
C819, 820	ECQM1H473JZ	0.047μF 50V	2
C821, 822	ECEA1HS100	10μF 50V	2
C823, 824	ECEA50MR1R	0.1μF 50V	2
C825, 826	ECEA50MR33R	0.33μF 50V	2
C827, 828	ECEA1AS221	220μF 10V	2
C829	ECEA1ES101	100μF 25V	1
C831, 832	ECKD1H103ZF	0.01μF 50V	2
C833	ECEA1HS100	10μF 50V	1
C834	ECKD1H103ZF	0.01μF 50V	1
C836	ECQM1H683KS	0.068μF 50V	1
C837	ECQM1H123KZ	0.012μF 50V	1
C838	ECQS1472JZ	4700 PF 125V	1
C839	ECQS1122JZ	1200 PF 125V	1
C840	ECQS1152JZ	1500 PF 125V	1
C841, 842	ECKD1H331KB	330 PF 50V	2
C843	ECEA1CS221	220μF 16V	1
C844	ECEA1HS100	10μF 50V	1
C846, 847	ECKD1H223ZF	0.022μF 50V	2
C861, 862	ECEA50MR22R	0.22μF 50V	2
C863, 864	ECEA1HS100	10μF 50V	2
C865, 866	ECEA50MR1R	0.1μF 50V	2
C867, 868	ECEA50MR1R	0.1μF 50V	2

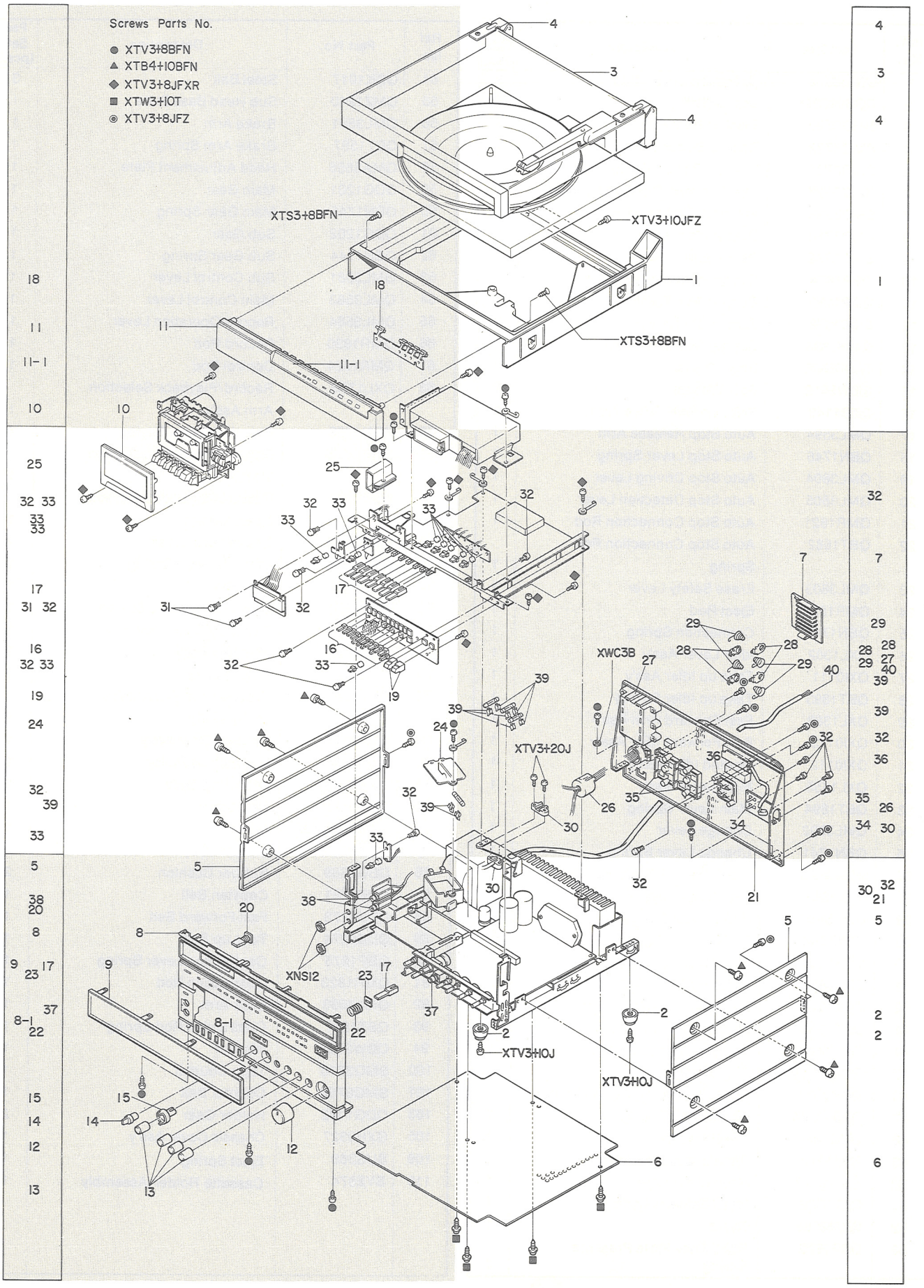
Ref. No.	Part No.	Description	Per Set (pcs.)
C869, 870	ECEA50MR1R	0.1μF 50V	2
C871	ECEA50Z1	1μF 50V	1
C901 ⚠	ECQM1224MZ	0.22μF 100V	1
C902	ECEA1VS102	1000μF 35V	1
C903, 904 ⚠	ECET42R682S	6800 PF 42V	2
C905	ECEA1HS100	10μF 50V	1
C906	ECEA1ES101	100μF 25V	1
C907	ECEA1CS221	220μF 16V	1
C908	ECEA1AS470	47μF 10V	1
C909, 910	ECEA1ES470	47μF 25V	2
C911	ECEA1CS221	220μF 16V	1
C912	ECEA25Z4R7	4.7μF 25V	1
C913	ECKD1H103ZF	0.01μF 50V	1
C914	ECKD1H223ZF	0.022μF 50V	1

REPLACEMENT PARTS LIST OF CABINET AND CHASSIS

Ref. No.	Part No.	Description	Per Set (pcs.)
1	SKY1854	Player Cabinet	1
2	SKL52	Foot	2
3	SYE862	Dust Cover Ass'y	1
4	SBH9098	Hing	2
5	SKE380	Side Board	2
6	SYU438	Bottom Cover	1
7	SKK108-1	Battery Lid	1
8	SYP552	Escutcheon Ass'y	1
8-1	SGK672	Cassette Panel	1
9	SGE1292	Transparent Cover	1
10	SYE820-1	Cassette Lid Ass'y	1
11	SYP554	Player Panel A	1
11-1	SGK674	Player Panel B	1
12	SBN1010	Knob, Volume	1
13	SBN1006	Knob, Control	4
14	SBN990-1	Knob, Select	1
15	SBN1016	Knob, Rec. Level	1
16	SBC462	Button, A	15
17	SBC458	Button, B	8
18	SBC470	Button, C	1
19	SBC464-1	Button, D	2
20	SYE744	Button, Power	1
21	SMN1396 ⚠	Panel, Rear	1
22	SUS374	Spring	1
23	SUD274	Spacer	1
24	SMX230 ⚠	Insulator Cover	1
25	SUV216 ⚠	Switch Cover, Power	1
26	SUV172 ⚠	Switch Cover, V Selector	1
27	SJK3402	Battery Case	1
28	SJC128	Battery Terminal	4
29	SJC518	Battery Spring	4
30	SHR134 ⚠	Cord Clamper, Power	2
31	SHR9112	Latch	2
32	RHR969ZA	Latch	10
33	SJY5162	Spacer	7
34	SJF4502-1	Terminal, ANT	1
35	SJF9410	Jack, Speaker	2
36	SJF3416	Jack, REC/AUX	1
37	XCJS6PE10	Jack, Headphone	1
38	XCJS6PA4	Jack, Microphone	2
39	SJF110 ⚠	Fuse Holder	8
40	SJA136 ⚠	AC Cord	1

Ref. No.	Part No.	Description	Per Set (pcs.)

PARTS LOCATION OF CABINET AND CHASSIS

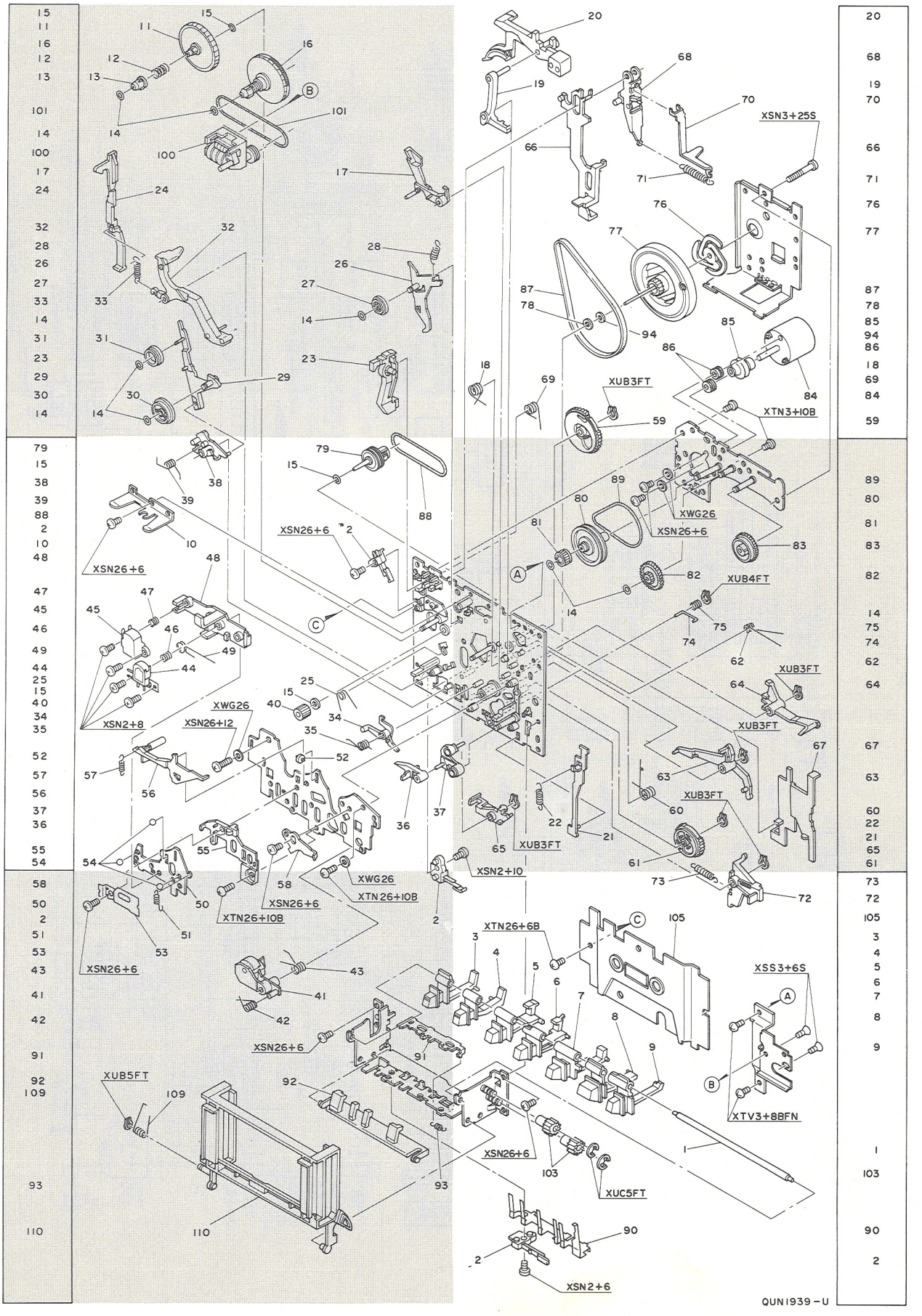


REPLACEMENT PARTS LIST OF CASSETTE TAPE DECK (QUN1939-U)

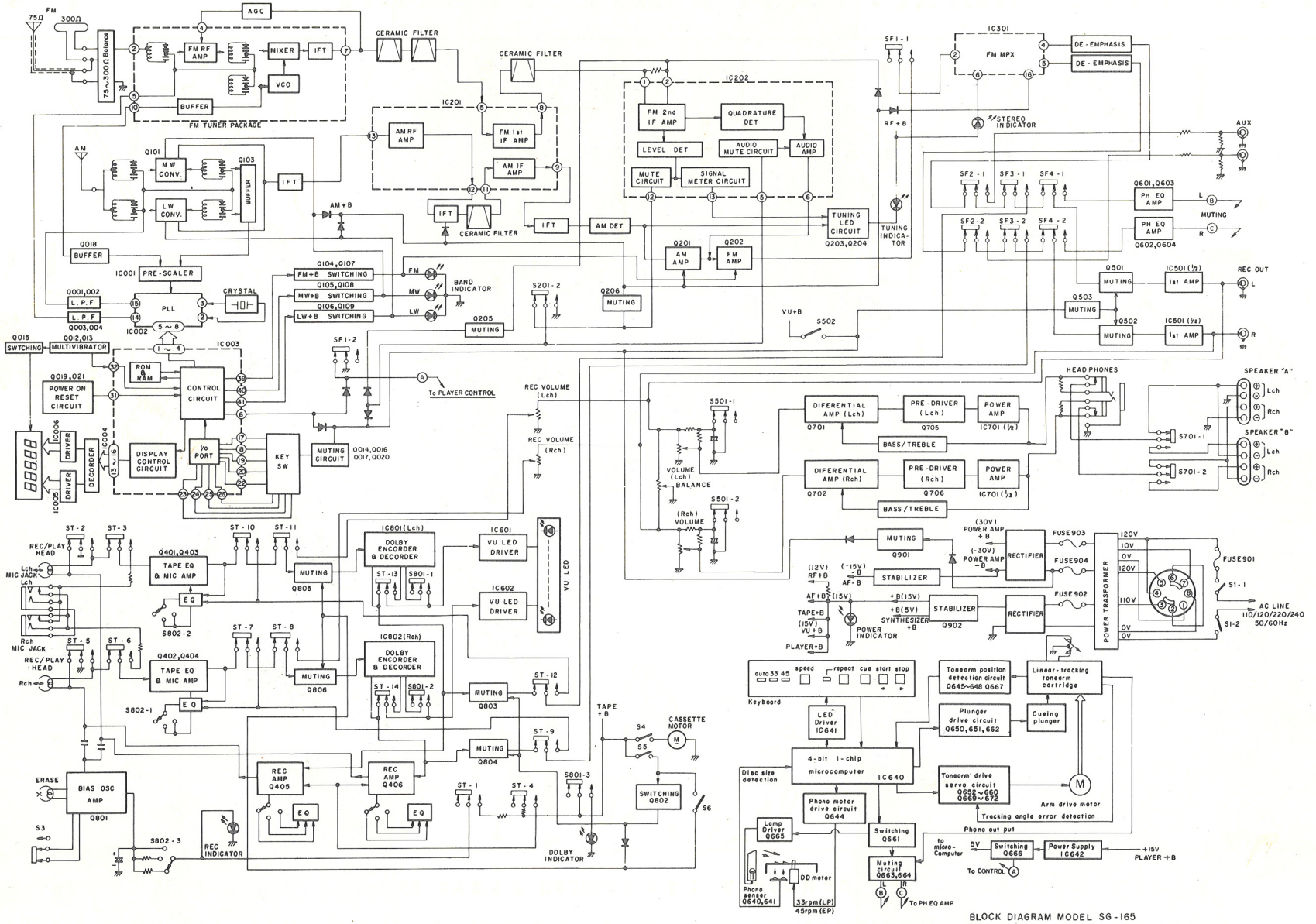
Ref. No.	Part No.	Description	Per Set (pcs.)
1	QMN2554	Operation Lever Shaft	1
2	QSB0253M	Leaf Switch	3
3	SMQ3720	Eject Button Ass'y	1
4	SMQ3722	Record Button Ass'y	1
5	SMQ3724	Rewind/Review Button Ass'y	1
6	SMQ3726	Fast Forward/Cue Button Ass'y	1
7	SMQ3728	Playback Button Ass'y	1
8	SMQ3730	Stop Button Ass'y	1
9	SMQ3732	Pause Button Ass'y	1
10	QBP1874	Cassette Pressure Spring	1
11	QDR1139	Supply Reel Table	1
12	QBC1372	Reel Table Spring	1
13	QMB1336	Supply Reel Table Hub	1
14	QBW2008	Poly Washer	7
15	QBW2012	Poly Washer	3
16	QXD1143	Take up Reel Table Ass'y	1
17	QML3594	Auto Stop Release Arm	1
18	QBN1746	Auto Stop Lever Spring	1
19	QML3604	Auto Stop Driving Lever	1
20	QML3605	Auto Stop Detection Lever	1
21	QMR1821	Auto Stop Connection Rod	1
22	QBT1682	Auto Stop Connection Rod Spring	1
23	QML3603	Erase Safety Lever	1
24	QMR1822	Eject Rod	1
25	QBN1747	Connection Spring	1
26	QXL1382	Idler Lever Ass'y	1
27	QXI0111	Take up Idler Ass'y	1
28	QBT1893	Take up Idler Spring	1
29	QXL1383	Fast Forward Arm Ass'y	1
30	QXI0113	Fast Forward Idler Ass'y	1
31	QXI0112	Rewind Idler Ass'y	1
32	QXL1355	Main Lever Ass'y	1
33	QBT1894	Main Lever Spring	1
34	QML3592	Change Lever	1
35	QBN1741	Change Lever Spring	1
36	QML3586	Head Base Plate Lift Lever	1
37	QXL1354	Sub Lever Ass'y	1
38	QML3588	Fast Forward Lever	1
39	QBN1748	Fast Forward Spring	1
40	QDP1828	Fast Forward Pulley	1
41	QXL1381	Pressure Roller Ass'y	1
42	QBN1742	Pressure Roller Release Spring	1
43	QBN1743	Pressure Roller Spring	1
44	QWY4122Z	Record/Playback Head	1
45	QWY2138Z	Erase Head	1
46	QBC1278	Record/Playback Head Spring	1
47	QBCA0008	Erase Head Spring	1
48	QMZ1241	Head Spacer	1
49	QBN1740	Head Pressure Spring	1
50	QMK1840	Head Base Plate	1
51	QBT1892	Head Release Spring	1
52	QMN2550	Roller	1
53	QBP1873	Head Base Plate Pressure Spring	1

Ref. No.	Part No.	Description	Per Set (pcs.)
54	QDK1017	Steel Ball	3
55	QMZ1240	Sub Head Base Plate	1
56	QML3591	Brake Arm	1
57	QBT1597	Brake Arm Spring	1
58	QMA3858	Head Adjustment Plate	1
59	QDG1201	Main Gear	1
60	QBN1745	Main Gear Spring	1
61	QDG1202	Sub Gear	1
62	QBN1744	Sub Gear Spring	1
63	QML3581	Sub Control Lever	1
64	QML3583	Main Control Lever	1
65	QML3584	Record Operation Lever	1
66	QMR1820	Record Rod	1
67	QMR1824	Control Rod	1
68	QXL1360	Record/Playback Selection Arm Ass'y	1
69	QBN1739	Selection Lever Spring	1
70	QML3580	Record/Playback Selection Lever	1
71	QBT1895	Record/Playback Selection Lever Spring	1
72	QML3582	Pause Lock Lever	1
73	QBT1896	Lever Release Spring	1
74	QBS1128	Lock Pin	1
75	QBC1357	Lock Pin Pressure Spring	1
76	QMZ1239	Flywheel Thrust Retainer	1
77	QXF0164	Flywheel Ass'y	1
78	QBW2049	Poly Washer	1
79	QXP0607	Fast Forward Connection Pulley Ass'y	1
80	QXG1047	Take up Gear Ass'y	1
81	QDP1823	Connection Pulley	1
82	QDG1199	Auto Stop Gear	1
83	QDG1200	Cam Gear	1
84	MMI6A2HKPD	Motor	1
85	QDP1831A	Motor Pulley	1
86	QBG1689	Rubber Cushion	2
87	QDB0281	Capstan Belt	1
88	QDB0273	Fast Forward Belt	1
89	QDB0274	Take up Belt	1
90	QBP1875	Obstruction Lever Spring	1
91	QMR1823	Obstruction Rod	1
92	QML3593	Lock Arm	1
93	QBT1597	Obstruction Rod Spring	1
94	QBW2026	Washer	1
100	SMQ3716	Tape Counter	1
101	SMQ3760	Counter Belt	1
103	QDG1102	Holder Gear	2
105	QXH0327	Chassis Cover Ass'y	1
109	SUS368	Eject Spring	1
110	SYE874	Cassette Holder Assembly	1

EXPLODED VIEW OF CASSETTE TAPE DECK (QUN1939-U)



BLOCK DIAGRAM



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